6.0 Conservation Element Supporting Documentation

~~Conservation Element~~

Conservation
FOUNDATION DOCUMENT

~~TABLE OF CONTENTS~~

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Conservation

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~~11-1 INTRODUCTION~~

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~~11~~6.1 Introduction

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~~Santa Rosa County is located in northwest Florida bordering the Gulf of Mexico and Santa Rosa Sound. The County is bounded on the west by Escambia County, on the east by Okaloosa County and on the north by Escambia County, Alabama.~~

Santa Rosa County is rich with a diversity of unique natural resources, but these resources are highly susceptible to human degradation. In order to preserve these natural resources now and for future generations, it is imperative that regulations maintain a balance between human activities and conservation. Paramount are the realities is the fact that both economic development and human health are ~~enter~~ related to environmental health.

~~The main purpose of the Conservation Element is to plan for development and, where appropriate, restrict or manage development activities where such activities would damage or destroy natural vegetative communities.~~

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~~A. Organization of the Element~~

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~~This element is divided into four sections: the Introduction, Terms and Concepts, Existing Regulatory Framework, and Data and Analysis. The Introduction provides an overview of the County in relationship to its location, history and its natural systems. Terms and Concepts define the terms used throughout most of this document. The Existing Regulatory Framework describes the current federal, state, regional and County regulations. The Data and Analysis section discusses the County's natural resources and includes information on land and water resources, topography, climate and rain fall, geology, minerals, soils, rivers, bays and lakes, water quality, wetlands, floodplains, fisheries, wildlife, marine habitats and vegetative communities, air quality, potable water needs, ground water quality, sand and gravel aquifer protection measures, and hazardous waste.~~

~~B. Relationship to other Elements of the Comprehensive Plan~~

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~~The *Future Land Use Element* and its accompanying Future Land Use Map provides the blueprint and growth management strategies for managing the County's future development. The Coastal Management and Conservation Elements provide the foundation and the detailed policies necessary for the conservation and preservation of the County's most valuable natural resources. It also directs development standards necessary to conserving the County's unique natural resources while allowing development to co-exist in a compatible and sustainable way.~~

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The *Parks and Recreation Element* uses the information from the conservation element to determine which natural resources are most conducive to recreational uses based on the current and future needs of the County.

The *Infrastructure Element* is directly related to the Conservation Element. The impacts of the existing and proposed facilities (drainage, water supply and waste water disposal) on natural systems must be considered during the establishment of the Level of Service (LOS) for water and sewer facilities, facility siting criteria and the overall policies regarding the County's growth-related infrastructure.

The *Transportation Element* deals with the County's moving people and goods in and through Santa Rosa County. Transportation facilities frequently fragment and isolate natural communities, which eventually leads to the destruction of both aesthetic and biological functions of the natural environment. The policies of the Transportation and Conservation Elements must be mutually supportive to ensure that transportation system design minimizes impacts to the environment.

The *Intergovernmental Coordination Element* provides opportunities to improve the County's collaboration and coordination with other local, state and federal agencies. These include agencies involved in natural resource conservation.

11-2 TERMS AND CONCEPTS

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Terms included in Appendix B of the Foundation Document are applicable to this element and are identified and described by the Florida Department of Community Affairs, in Rule 9J-5 of the Florida Administrative Code (F.A.C.) and in Section 163.3164, Florida Statutes (F.S.). All other terms and concepts used in this element are consistent with the intent of Rule 9J-5 and Chapter 163, F.S.

Aquifer: A geologic formation, group of formations, or part of a formation that is capable of yielding a significant amount of ground water to wells, springs or surface waters. (DEP)

Bays and Estuaries: inlets of the ocean that extend into the land area. Saline and coastal plankton estuaries lie in the subtidal and intertidal area of the ocean. Large vegetation species have not adapted to this area; however, this area provides habitat and food sources for fish, invertebrates, wading birds, and waterfowl. Plankton, an organic species that drifts and floats with the tides, provides food for these species. (Water Resources Atlas of Florida, 1984)

Biological Diversity: The ability to sustain the State's rarest animals, plants and natural communities well into the future through preservation of minimum habitat areas necessary to sustain identified species not presently being protected by any other conservation technique. (FGFWFC)

Coastal Construction Control Line (CCCL): established by Florida Department of Environmental Protection (FDEP) by Chapter 161.053, F.S., as being the County's line of regulatory prohibition (established boundary in front of which no construction is allowed without permits from DEP), or Dune Stabilization Setback Line (DSSL).

Conservation Corridors: These are less extensive linear protected areas that serve as biological connecting corridors and in many cases also provide outdoor, resource-based recreational opportunities. (DEP)

Ecosystems Management: considers the overall ecological perspective that provides the opportunity to support the conservation and preservation of regional ecological systems. These management concepts

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encourage innovative, cooperative solutions to the environmental problems through the involvement and cooperation of all Florida citizens, not just the government. (DEP)

Ecosystems Management Areas (EMA): defined by drainage basins or watersheds that are hydrologically and ecologically connected and are of environmental significance. (DEP)

Endangered Species: a species, subspecies or isolated population which is so few or depleted in number or so restricted in range or habitat due to any man-made or natural factors that it is in imminent danger of extinction or extirpation from the state or which may attain such a status within the immediate future. (FWC)

Essential Habitat: Habitat which if lost would result in elimination of the Endangered and Threatened Species and Species of Special Concern from the area in question. Essential Habitat typically provides functions for the Endangered and Threatened Species during restricted portions of that species life cycle. Habitat includes the place or type of site where a species naturally or normally nests, feeds, resides, or migrates, including for example, characteristic topography, soils and vegetative cover.

Estuary: areas of the coast where mainland, barrier islands, or vegetation partially enclose a water body made brackish by the mixing of salt and fresh waters and which contain marine plants and animals adjusted to the changing water conditions in these areas" (Water Resources Atlas of Florida, 1984).

Floridan Aquifer System: A thick limestone aquifer that underlies all of Florida, as well as portions of southeastern Alabama, South Georgia and southern South Carolina. This aquifer is the primary source of drinking water to all but the southern peninsular and extreme westernmost panhandle of Florida. (DEP)

Greenbelt: Protected natural lands or working landscapes that surround cities are called a greenbelt. They serve to preserve agriculture productivity as well as to balance and direct urban and suburban growth. (DEP)

Greenway: a corridor of protected open space that is managed for conservation and/or recreation. The common characteristic of greenways is that they all go somewhere. Greenways follow natural land or water features, like ridges or rivers, or human landscape features like abandoned railroad corridors or canals. They link natural reserves, parks, cultural and historic sites with each other and, in some cases, with populated areas. Greenways not only protect environmentally sensitive lands and wildlife, but can also provide people with access to outdoor recreation and enjoyment close to home. (DEP)

Habitat: Environmental characteristics conducive to survival of certain plants and animals based on favorable soil types, topography, hydrology, mineral content and vegetative communities.

High Recharge Areas: an area so designated by the appropriate water management district governing board. High recharge and prime recharge areas shall receive a level of protection commensurate with their significance to natural systems or their status as current or future sources of potable water.

Listed Species: Animals, plants, and/or insects identified as Endangered and Threatened and Species of Special Concern by the United States Environmental Protection Agency, the Florida Fish and Wildlife Conservation Commission (FWC) and the Florida Department of Agriculture (FDA).

Open Spaces: undeveloped lands suitable for passive recreation or conservation uses.

Pensacola Bay System: includes five interconnected estuarine embayments, including Escambia Bay, Pensacola Bay (Escambia County), Blackwater Bay, East Bay, and Santa Rosa Sound, and three major river systems: the Escambia, Blackwater, and Yellow rivers. The system also includes smaller tributaries of these embayments and rivers, as well as its entire watershed.

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~~*Recharge*: Water entering the aquifer from any source, including infiltration from rainfall, soil moisture, drainage wells and surface water bodies. (DEP)~~

~~*Species of Special Concern*: a species, subspecies, or isolated population which warrants special protection, recognition, or consideration because it has an inherent significant vulnerability to habitat modification, environmental alteration, human disturbance, or substantial human exploitation which, in the foreseeable future, may result in its becoming a threatened species; may already meet certain criteria for designation as a threatened species but for which conclusive data are limited or lacking; may occupy such an unusually vital and essential ecological niche that should it decline significantly in numbers or distribution, other species would be adversely affected to a significant degree; or has not sufficiently recovered from past population depletion. (FWC)~~

~~*Strategic Habitat Conservation Areas*: protects some of the state's rarest animals, plants and natural communities with a land base necessary to sustain populations now and into the future. The designated areas at a minimum must contain 30 species of wildlife inadequately protected by the current system of land conservation, contain high quality sandhill sites, scrub sites, pine rock lands sites, tropical hardwood hammocks, bat maternity caves and winter roost caves, wetlands important to the long term survival of 105 globally rare species of plants. (FWC)~~

~~*Suitability*: the degree to which the existing characteristics and limitations of land and water are compatible with a proposed use or development. (FWC)~~

~~*Threatened Species*: a species, subspecies, or isolated population which is acutely vulnerable to environmental alteration, declining in number at a rapid rate, or whose range or habitat is declining in area at a rapid rate and as a consequence is destined or very likely to become an endangered species within the foreseeable future. (FWC)~~

~~*Vegetative Communities*: ecological communities, such as coastal strands, oak hammocks, and cypress swamps, which are classified based on the presence of certain soils, vegetation and animals.~~

~~*Wetlands*: those areas that are inundated or saturated by surface water or ground water at a frequency and a duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soils. Soils present in wetlands generally are classified as hydric or alluvial, or possess characteristics that are associated with reducing soil conditions. The prevalent vegetation in wetlands generally consists of facultative or obligant hydrophytic macrophytes that are typically adapted to areas having soil conditions described above. These species, due to morphological, physiological, or reproductive adaptations, have the ability to grow, reproduce or persist in aquatic environments or anaerobic soil conditions. Florida wetlands generally include swamps, marshes, bayheads, bogs, cypress domes and strands, sloughs, wet prairies, riverine swamps and marshes, hydric seepage slopes, tidal marshes, mangrove swamps and other similar areas. Florida wetlands generally do not include longleaf or slash pine flatwoods with an understory dominated by saw palmetto. The delineation of actual wetland boundaries may be made by any professionally accepted methodology consistent with the type of wetlands being delineated but shall be consistent with any unified statewide methodology for the delineation of the extent of wetlands ratified by the Legislature.~~

116.2 Existing Regulatory Framework~~11-3 EXISTING REGULATORY FRAMEWORK~~

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This section focuses on the environmental resources that are regulated throughout the development review process at the local, state, regional and federal levels within Santa Rosa County. Santa Rosa County currently relies on state and federal programs for environmental regulation and review for the most part. ~~These~~However, these ~~-~~reviews and regulations are complimented locally by County requirements found within this Plan, the Land Development Code and the vast conservation lands located within the County. Additional regulatory information is also found within the Supporting Documentation for the Infrastructure Element, specifically pertaining to st~~o~~r~~r~~mwater management and water quality protection measures.

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Wetlands and Water Quality – Florida's Environmental Resource Permitting (ERP)

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Florida law requires environmental resource permits for many types of work within wetlands and surface waters, such as dredging or filling; construction of dams, impoundments, docks or other structures; the construction of stormwater management systems that discharge to those waters; and other kinds of land disturbance activities. For development activities in Santa Rosa County, t~~T~~he ERP program regulates stormwater runoff in ~~most~~certain new developments to protect water quality, prevent flooding and to avoid adverse impacts to off-site property.

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Rule 62-330.020, F.A.C., describes activities that require a permit. In general as it relates to land development, a permit is required prior to the construction, alteration, operation, maintenance, removal, or abandonment of any new project that, by itself or in combination with an activity conducted after [October 1, 2013], cumulatively results in any of the following:

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(a) Any project in, on, or over wetlands or other surface waters;

(b) A total of more than 4,000 square feet of impervious and semi-impervious surface areas subject to vehicular traffic;

(c) A total of more than 9,000 square feet impervious and semi-impervious surface area;

(d) A total project area of more than one acre;

(f) Any dam having a height of more than 10 feet, as measured from the lowest elevation of the downstream toe to the dam crest;

(g) Any project that is part of a larger common plan of development or sale;

(h) Any dry storage facility storing 10 or more vessels that is functionally associated with a boat launching area;

(i) Any project exceeding the thresholds in section 1.2 (District-specific thresholds) of the applicable Volume II; or

j) Any modification or alteration of a project previously permitted under Part IV of Chapter 373, F.S.

The types of permits available are general permits, individual permits (which include mitigation bank permits), and conceptual approval permits. The ERP program ~~also~~ issues general permits that ~~what a~~are commonly known as "ten-two" general permits. In 2012, the Florida Legislature adopted a general permit that allows for the construction, alteration and maintenance of certain smaller projects without agency review or action. Under this law, Section 403.814 (12), F.S projects involving less than two acres impervious surface and less than 10 acres of total project area that are located within state lands or water with no wetland impacts, may proceed subject to the conditions of the general permit.

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The permit process includes coordination with other state agencies including Florida's approved Coastal Zone Management Program (FDEP), the Florida Fish and Wildlife Conservation Commission, and the

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Florida Department of State, Division of Historical Resources. Those agencies may comment on the application as it is being processed, and may request additional information be provided to them so that they may fully evaluate the application. The Agencies shall consider comments that are timely received in the course of processing the application. As provided by Section 373.428, F.S., these agencies also may object to issuance of the project under the Coastal Zone Management Act.

The need for a wildlife survey will depend upon the likelihood that the site is used by listed species and the bald eagle, considering site characteristics and the range and habitat needs of such species, and whether the proposed activity will impact that use such that certain criteria are not met.

ERPs also regulate dredge and fill activities in tidal and freshwater wetlands, including contiguous and isolated wetlands. The ERP program operates independently of the federal dredge and fill permitting program, which is regulated by the US Army Corps of Engineers, although a joint application process has been developed between the sState and Corps.

Criteria for determination of State of Florida jurisdictional wetlands are set forth in Rule 62-340, Florida Administrative Code. Federal jurisdiction under the Federal Clean Water Act is limited to "waters of the United States". What waters constitute "Waters of the United States" was the subject of a recent U.S. Supreme Court decision commonly referred to as the SWANCC (Solid Waste of Northern Cook County) decision. This decision, as currently interpreted (it's subject to a pending Federal rule making initiative), results in a lack of Federal jurisdiction over certain isolated wetlands. State jurisdiction in Peninsular Florida under the Part IV, Ch. 373, F.S., ERP program extends from property line to property line of the project area. However, within the project area only those areas that are delineated as wetlands (including all isolated wetlands) under the State methodology are subject to the environmental provisions of s. 373.414, F.S. The remainder of the project area is considered uplands and subject only to the "stormwater" quality and quantity provisions of the ERP program.

In summary, both Florida and the Federal government have methods to delineate the boundaries of areas considered wetlands although there are differences in the methods that may produce different wetland boundaries in some situations. However, not all areas that are delineated as wetlands are subject State and Federal jurisdiction as noted above. Further within those areas that are subject to State or Federal jurisdiction certain activities are not regulated due to a variety of statutory and rule exemptions from regulation.

The *U. S. Army Corps of Engineers* regulatory program considers waters of the United States to be all tributary streams to navigable waters to a point where flows are less than 5 cubic feet per second. In general, this criterion is being interpreted as the uppermost 5 square miles of all watersheds, but actual determination is made on a case-by-case basis. The determination of federal jurisdiction of a proposed project will be made by the Corps of Engineers. All proposed development actions by private individuals or public agencies are subject to Corps of Engineers regulatory review.

The U.S. Army Corps of Engineers regulates activities in open waters and wetlands under the following four separate but related laws:

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1. The Rivers and Harbors Act of 1899 which requires authorization for activities such as constructing piers, bulkheads, subaqueous pipelines, filling, dredging, stream channelization, and similar works in navigable waters of the United States. In response to 1968 court rulings, permit application reviews, now include protection of fish and wildlife, conservation, pollution, aesthetics, ecology, and general public interest;

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2. The Federal Water Pollution Control Act of 1972 requiring the restoration and maintenance of the chemical, physical, and biological integrity of the nation's waters. Section 404 of the Act established the permit program to regulate discharges of dredge or fill material into waters of the United States;
3. The Clean Water Act of 1977 expanded the Corps Section 404 authority to include, but not be limited to, all coastal and inland waters, lakes, tributaries to navigable waters, wetlands adjacent to navigable waters, and certain isolated wetlands and water bodies;
4. The Marine Protection Research and Sanctuaries Act of 1972 authorizes the Corps of Engineers, under Section 103, to issue permits for the transportation of dredged material for ocean disposal.

In general, Corps of Engineer permits are required for any construction in all tidal areas channel ward of mean high water lines.

~~*A.11.2.1 Federal*~~

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~~*The Endangered Species Act (ESA), adopted by congress in 1973, establishes criteria for the listing of plants and animals as threatened or endangered. The ESA also provides a permitting program which helps ensure that ecosystems containing listed species are conserved during development activities*~~

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~~*The Clean Water Act (CWA), 33 U.S.C. §1251 et seq. (1972), establishes the basic structure for regulating discharges of pollutants into the waters of the United States and regulating quality standards for surface waters. The basis of the CWA was enacted in 1948 and was called the Federal Water Pollution Control Act, but the Act was significantly reorganized and expanded in 1972. "Clean Water Act" became the Act's common name with amendments in 1972. Under the CWA, EPA has implemented pollution control programs such as setting wastewater standards for industry. We have also set water quality standards for all contaminants in surface waters. The CWA made it unlawful to discharge any pollutant from a point source into navigable waters, unless a permit was obtained. EPA's National Pollutant Discharge Elimination System (NPDES) permit program controls discharges. Point sources are discrete conveyances such as pipes or man-made ditches. Individual homes that are connected to a municipal system, use a septic system, or do not have a surface discharge do not need an NPDES permit; however, industrial, municipal, and other facilities must obtain permits if their discharges go directly to surface waters.*~~

~~*The Farmers Home Administration (FHA) provides assistance to farm and ranch owners in the form of non-farm enterprise loans of up to $300,000 and management assistance for the development of non-farm enterprises to supplement farm incomes. Loans may be used to develop campsites and riding stables. Under rules developed by the agency to implement the Food Security Act of 1985 (P.L. 99-198), farmers and ranchers are permitted to retire part of their government-insured debt by donating 50-year conservation easements on portions of their lands. Agreements must be developed with public land management agencies or private organizations to manage the easements for public benefit for fish and wildlife, conservation, or recreation.*~~

~~*The Clean Water Act establishes a permitting program and criteria for the discharge of pollutants into the County's waters, including minimum water quality standards. The Act focuses primarily on the surface waters and provides the greatest protection for wetlands of any federal legislation.*~~

~~*The Rivers and Harbor Act of 1899 regulates all the activities affecting the navigable waters of the United States, including the approval of dredging and filling operations activities in the wetlands. This regulation affects the construction of bridges, roads, wharves and just about every activity that could be interpreted as*~~

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affecting navigable waters. The primary enforcement agency is the U.S. Army Corps of Engineers, which may solicit comments from agencies during its review of activities that fall under this Act.

The National Wild and Scenic Rivers Act of 1968 (16 United States Code 1271) requires that rivers possessing outstanding scenic, cultural or other similar values be preserved in a free flowing condition and protected along with their immediate environments for public benefit. Management plans are developed at the local level at the direction of state agencies.

The National Flood Insurance Act of 1968 establishes the National Flood Insurance Program (NFIP), which makes fFederally subsidized flood insurance available in communities which adopt and adequately enforce floodplain management ordinances that meet NFIP requirements. The Act also required that the Federal Emergency Management Agency establish flood risk zones in all flood prone areas.

The Migratory Bird Treaty Act of 1998, as amended, 16 United States Code, sections 703 et seq., under Florida law states that it is unlawful to disturb, remove, or interfere with, in any manner or by any means, a nest, any part thereof, or its environment, inhabited or used by, any migratory bird or birds in danger of extinction, threatened, or otherwise protected by Federal or Florida law. It is likewise unlawful, except as permitted by regulation, or by any other means or any manner to pursue, hunt, capture, kill, or possess any of the aforementioned birds, their eggs, or their nests.

B. State11.2.2 State

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The State's Local Government Comprehensive Planning and Land Development Regulation Act requires that all the Counties and Cities in the state prepare and adopt a Comprehensive Plan containing mandatory elements that address growth management issues including a Conservation Element.

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Land Acquisition/Preservation

In 1999, the Florida Legislature passed the Florida Forever Act with the support of Governor Jeb Bush. Florida Forever resulted in a major revision and replacement of the Save our Rivers and CARL Programs, which we now call the State and Water Management District Florida Forever Programs, respectively, while continuing funding to the Florida Communities Trust, the three Inholdings and Additions programs, and Greenways and Trails. As did its predecessor, Florida Forever authorizes the sale of up to $300 million in bonds for ten years, but distributed differently than under Preservation 2000. The Florida Forever Program that replaced CARL receives 35 percent, another 35 percent is divided among the five water management district programs, Florida Communities Trust receives 22 percent, each Inholdings and Additions program receives 1.5 percent, as does Greenways and Trails. The final 2 percent goes to the Florida Recreational Development Assistance Program to fund development of recreational facilities.

The State of Florida passed the Outdoor Recreation and Conservation Act, which established a Land Acquisition Trust Fund administered by the Department of Environmental Protection (DEP). This Act also provided for loans and grants to local governments for acquisition of public beach tracts (F.S., Chapter 375). The State may also acquire property for parks through a State Park Trust (F.A.C., Chapter 592).

Total Maximum Daily Loads (TMDLs)

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Under section 303(d) of the Clean Water Act, states, territories, and authorized tribes are required to develop lists of impaired waters. These are waters that are too polluted or otherwise degraded to meet the water quality standards set by states, territories, or authorized tribes. The law requires that these jurisdictions establish priority rankings for waters on the lists and develop TMDLs for these waters. A Total Maximum Daily Load, or TMDL, is a calculation of the maximum amount of a pollutant that a waterbody can receive and still safely meet water quality standards.

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~~*On December 5, 2013, EPA announced a new collaborative framework for implementing the Clean Water Act Section 303(d) Program with States: A Long-Term Vision for Assessment, Restoration, and Protection under the Clean Water Act Section 303(d) Program. This Vision reflects the successful collaboration among States and EPA, which began in August 2011. While the Vision provides a new framework for implementing the CWA 303(d) Program, it does not alter State and EPA responsibilities or authorities under the CWA 303(d) regulations.*~~

~~*Currently two Santa Rosa County water bodies have established TMDLs. The Blackwater River and the East Bay River.*~~

~~*The Blackwater River is 56.6 miles long, originating from southern Alabama and flowing through the Florida Panhandle to Pensacola Bay. The river enters Florida in Okaloosa County and flows through Santa Rosa County to Blackwater Bay, an arm of Pensacola Bay. The Blackwater River (tidal) watershed (is located in the middle of Santa Rosa County, about 0.5 miles northeast of Interstate 10 (Figures 1.1 and 1.2). The watershed drains an area of approximately 3.2 square miles. Additional information about the hydrology and geology of this area is available in the Water Quality Status Report for the Pensacola Bay Basin (Department 2004).*~~

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~~*WBID 24A was placed on the Cycle 1 Verified List for fecal coliform but subsequently was retired to form two new WBIDs: a freshwater WBID (24AA) and a marine WBID (24AB) (Figure 1.2). While there are sufficient data to verify that WBID 24AB is impaired for coliform, there are insufficient data to either verify impairment or delist WBID 24AA. WBID 24AA has been placed in Category 3c (potentially impaired) and will be maintained on the federally approved 303(d) list.*~~

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~~*The East Bay River, located in Santa Rosa and Okaloosa Counties, is 15 miles long. It flows from east to west and empties into East Bay, an arm of Pensacola Bay. The East Bay River (marine portion) watershed is located at the southeast corner of Santa Rosa County. The southern portion of the watershed is urbanized, while the northern portion is relatively undeveloped. Additional information about the hydrology and geology of this area is available in the Water Quality Status Report for the Pensacola Bay Basin (Department 2004).*~~

~~*WBID 701, which was designated as Class III predominantly fresh water, was retired to form two new WBIDs: 701A and 701B (Figure 1.2). WBID 701A was reclassified as Class II estuarine waters, and WBID 701B as Class III predominantly fresh water.*~~

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~~*Wetlands*~~

~~*Coast Regulation of the taking of living resources from waters within Coastal Barrier Resource System (CBRS) units falls under the jurisdiction of the U.S. Fish and Wildlife Service. al Resources*~~

~~*Ground and Surface Water*~~

~~*The DEP has permitting authority over any discharge of waste into surface or ground water. The Northwest Florida Water Management District (NWFWMD) has permitting authority for withdrawal, storage, diversion, and consumption of water.*~~

Flora and Fauna

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~~The minimum criteria for local government Comprehensive Plans to follow is established in the Florida Administrative Code (F.A.C.), Rule 9J-5. This rule is used by the Department of Community Affairs (DCA) to determine whether such plans fulfill the requirements of the State's Growth Management Act. This rule prescribes the minimum requirements for each element of the Comprehensive Plan.~~

~~Developments of Regional Impact (DRI) must be reviewed by Regional Planning Councils and the Department of Community Affairs (DCA). The DEP has permitting authority over any discharge of waste into surface or ground water. The Northwest Florida Water Management District (SJRWMDNWFWMD) has permitting authority for withdrawal, storage, diversion, and consumption of water. Regulation of the taking of living resources from waters within Coastal Barrier Resource System (CBRS) units falls under the jurisdiction of the U.S. Fish and Wildlife Service.~~

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~~The DEP also has jurisdiction over all permitting for dredge and fill activities in submerged lands and wetlands. In general, the DEP's jurisdiction over dredge and fill activities is coincident with that of the U.S. Army Corps of Engineers, although in some cases the DEP may be more stringent. The DEP requires that environmental impacts be considered in any application for a dredge and fill permit. Marinas and boat docks are also permitted through the DEP.~~

~~The State of Florida passed the Outdoor Recreation and Conservation Act, which established a Land Acquisition Trust Fund administered by the Department of Environmental Protection (DEP). This Act also provided for loans and grants to local governments for acquisition of public beach tracts (F.S., Chapter 375). The State may also acquire property for parks through a State Park Trust (F.A.C., Chapter 592).~~

Article IV, Section 9, of the Florida Constitution and Chapter 372, F.S., designates the Fish and Wildlife Conservation Commission (FWC) [previously Game and Fresh Water Fish Commission (FGFWFC)] as the agency with the authority to exercise all the non-judicial powers of the state with respect to wild animals and freshwater aquatic life. As part of its total program, the Commission administers wildlife and fish management areas on state, federal and privately owned lands. The fish management program includes maintaining boat ramps, stocking game fish, installing fish attractors, and controlling undesirable aquatic plants. The Commission receives funds for the preservation, restoration and enhancement of Florida's fish and wildlife resources from the Federal government. The Commission also manages a nongame fish and wildlife program funded by the Nongame Wildlife Trust Fund.

The Florida Endangered and Threatened Species Act and the Preservation of Native Flora of Florida Act established criteria for the listing, protection and management of plant and animal species considered to be endangered, threatened or species of special concern.

The Florida Wildlife Code (Chapter 39, F.A.C.)- restricts the pursuit, molestation, harm, harassment, capture, or possession of a listed species. The Code establishes a permitting program for such activities, including permits for the "incidental take" (unlawful killing "incidental to" otherwise allowable activities) of individual animals.

~~The Water Resources Act established state water policy and implementation measures, which include the creation of the five regional Water Management Districts. This Act also mandates the formulation of a state water use plan.~~

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~~The Florida Water Quality Assurance Act requires the Florida Department of Environmental Protection (FDEP) to maintain a statewide groundwater quality monitoring network and a database.~~

~~The Florida Safe Drinking Water Act establishes a statewide framework for regulating drinking water quality.~~

~~The Groundwater Protection Rule (1984) establishes guidelines for the restoration, conservation and management of the State's groundwater resources. Florida was the first state in the nation to adopt such a rule.~~

~~The Surface Water Improvement and Management (SWIM) Act of 1987 requires each of the State's five Water Management Districts to identify those surface waters most in need of restoration or preservation. This Act mandates the development of management plans ("SWIM plans ") for each water body so identified, including detailed schedules of implementation. The SWIM program and Save Our Rivers program are administered by the Water Management Districts. Lands may be acquired through these programs and made available for public recreation uses when compatible with the management of the property. The Pensacola Bay System, has been a SWIM project since 1992.~~

~~The Florida Scenic and Wild Rivers Program was established by the DEP Executive Board in January 1972 and revised in June 1978. The program is designed to preserve the aesthetic and wilderness qualities of exceptional rivers and streams in the State. The program is similar to the National Wild and Scenic Rivers Program described in the previous section, but it is a separate program.~~

~~Sections 258.35-258.46, F.S., the Florida Aquatic Preserve Act of 1975 were intended to set aside state-owned submerged lands having exceptional biological, aesthetic and scientific value as aquatic preserves or sanctuaries forever. Santa Rosa County has one aquatic preserve, the Yellow River Marsh Aquatic Preserve.~~

~~Chapter 260.011- 260.018, F.S., the Florida Greenway and Trail System establishes the planning, development, operation and maintenance of this system. It is the intent of the Legislature to officially recognize the Florida National Scenic Trail as Florida's official statewide trail from the Panhandle to the Everglades. This system will function as a statewide system of greenways and open space benefiting environmentally sensitive lands and wildlife.~~

~~In 1993, legislation was passed to enable the State, through the Florida Department of Transportation, to establish an official program for scenic highways. In 1994, the Department applied for and received a Scenic Byway Grant from the FHWA to develop a Florida Scenic Highways Program. Prior to the ISTEA legislation, Florida had no official statewide scenic highway programs~~

~~The Florida Solid Waste Management Act (1988) requires each County and City to include recycling programs in their comprehensive plans and to develop and initiate recycling programs with the goal of reducing the waste stream by 30 % by the end of 1994.~~

~~C. Regional~~

~~The West Florida Regional Planning Council adopted a Strategic Regional Policy Plan in July 1996. The following *Regional Goals* are directly related to the Conservation Element:~~

- ~~Reduce the risk of injury and/or death from the release of chemical hazards at storage facilities and along transportation networks and increase the Region's readiness to respond to and contain a toxic release by improved training and increased funding.~~
- ~~Protect the surface water resources within the Region.~~

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- Manage the Regional water supply to provide for all recognized needs on a sustainable basis and protect water recharge areas and existing and future well sites.
- Protect and manage marine fisheries habitat.
- Continue to protect the Region's functioning natural systems.
- Protect native species in the Region that are on the Florida Game and Fresh Water Fish Commission list of endangered, threatened, and rare species of Florida.
- By the year 2000, public and private lands will be managed and land resources used according to comprehensive, economic and environmental principles, especially critical areas including, but not limited to coastal lands, wetlands, flood plains, margins of estuarine nursery areas, and locally important agricultural lands.
- Protect environmentally, historically, and culturally significant land.

D. Local

The Santa Rosa County Land Development Code includes numerous regulations that require new development and redevelopment to preserve and protect the county's natural resources.

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~~11-4 DATA AND ANALYSIS~~

~~A. General~~

6.3 Environmental Characteristics

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6.3.1 ~~A.1~~ Topography

Santa Rosa County lies within the Coastal Plain, a broad belt consisting primarily of unconsolidated sands, silts and clay. The County is divided into two physiographic divisions, the Western Highlands and the Gulf Coastal Lowlands. Most of the County is located in the Western Highlands, which is a southwardly sloping plateau whose surface has been cut by numerous streams. The three principal streams that drain this area are the Escambia, Blackwater and Yellow Rivers. The many smaller streams that feed these rivers have a trellis drainage pattern and commonly head in small steep sided box canyons known as steepheads. Steepheads form where undermining by springs create steep slopes at the head of smaller streams. Several faults in the northern part of the County, where elevation ranges from 100 to 290 feet above sea level, form steep hills.

The Gulf Coastal Lowlands is the low-lying area of southern Santa Rosa County. The Lowlands are a series of parallel terraces consisting of relatively un-dissected, nearly level plains rising from the coast in successively higher levels. They formed during the Pleistocene Epoch (Great Ice Age) when fluctuating sea levels were associated with the growth and melting of ice caps. Dunes, barrier islands, beach ridges, and other topographical features were stranded inland as seas receded. The highest terrace has an elevation of about 100 feet. At least 50 miles of shoreline scarps carved by the Penholoway Sea are preserved along the valleys of the Escambia, Blackwater, Yellow and East Bay Rivers. The largest unbroken terrace area in westernmost Florida is the peninsula that extends southward between the mouths of the Escambia and Yellow Rivers, separating Escambia Bay from East Bay. This area covers approximately 27 square miles and elevations range from sea level to 30 feet above sea level.

The southern boundary of the Gulf Coastal Lowlands is formed by Santa Rosa Island, which is approximately 50 miles long and varying between approximately 1,000- 1,500 feet wide (Otvos, 1982; cited in Morang, 1992). The island is made up of Holocene quartz sands, between 15 and 30 feet thick, overlying a Pleistocene core.

~~A.2 Climate and Rainfall~~

~~Climatic conditions in northwest Florida are heavily influenced by large-scale weather systems that move across the region. Major air masses moving across the continental United States from west to east often determine weather conditions in northwest Florida. Polar air masses that penetrate southward produce frontal systems with associated winds and rainfall. During summer months, these systems often have limited influence upon northwest Florida. During winter months, frontal systems provide the source of energy to produce much of the winter rainfall across northwest Florida. The heaviest rainfalls recorded within Santa Rosa County outside of tropical storms or hurricanes have been associated with frontal systems that have stalled and channeled precipitation along disturbed frontal zones.~~

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~~Tropical storms and hurricanes provide occasional rainfall in Santa Rosa County. Any tropical storm that passes within roughly 250 miles of the County is likely to provide some increased local rainfalls. An intense tropical storm or hurricane passing close to the County may be expected to provide heavy rainfalls.~~

~~The normal annual rainfall recorded by the National Climatic Data Center, Southeast Regional Climate Center for Milton Experiment Station during the 1948-2000 period is 67.05 inches. Annual rainfall amounts received in Santa Rosa County are highly variable from year to year. No pattern of rainfall change has been identified. The minimum annual rainfall recorded for Milton Experiment Station was 35.46 inches in 1954; the maximum annual rainfall received was 105.48 inches in 1975. Rainfall events are heaviest in July, August, and September and lightest in October and November. On rare occasions the County receives a measurable amount of precipitation in the form of snow. The maximum amount of snow recorded in the County was 4 inches in both 1954 and 1977. Extended droughts are infrequent, while shorter droughts are rather common. The longest period without measurable rainfall was 48 days, from September 23 to November 9, 1952. The County has been experiencing drought conditions for the last 3 years. The annual rainfall from 1999 to 2001 is over 60 inches below normal.~~

~~A.3 Climate and Temperature~~

~~Local temperatures and their seasonal changes reflect climatic conditions characteristic of the northwest Florida. Santa Rosa County has borderline subtropical temperatures with rare, short-duration freezing events affecting the County during late December through March.~~

~~Historical records for Santa Rosa County during the period from 1948 to 2000 indicated an average January temperature of 51 degrees Fahrenheit with a lowest recorded temperature of 3 degrees. The July average temperature for that period was 81 degrees with a maximum recorded temperature of 104 degrees. Winter temperatures are cool enough to give a pronounced seasonal character to plant growth. Winter cool temperatures are sufficient to terminate growth cycles of some plants, while many others become dormant~~

~~The southern portion of the County has temperatures moderated by the Gulf of Mexico, Santa Rosa Sound, Escambia Bay and East Bay. The western portion of the County has temperatures moderated somewhat by the Escambia River. The interior of the County can expect to have slightly warmer summer temperatures and noticeably cooler winter temperatures than either the southern or western parts of the County.~~

~~A.4~~ 6.3.2 Geology

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Santa Rosa County is underlain by a veneer of Pleistocene terrace deposits overlying Tertiary beds of sand, silt, and limestone which dip southwestward at 30 to 40 feet per mile (Marsh, 1966). Stratigraphically, these sediments are referred to as undifferentiated alluvium and terrace deposits underlain by the Citronelle Formation. The uppermost part of this sequence forms the Sand-and-Gravel Aquifer. Major tributaries of the system are incised into the Sand-and-Gravel Aquifer. Groundwater flow from this aquifer discharges to these tributaries and to the bays. Marsh (1966) also suggests that three marine surfaces of Pleistocene age can be recognized in the area; the Pamlico terrace at 30 feet, the Penholoway terrace at 70 feet, and a seaward sloping upland surface whose altitude ranges from about 60 to 200 feet. Remnants of these terraces are preserved as upland plateaus, flat-topped hills, and low coastal plains.

Santa Rosa Island is considered a classic example of bay barrier bar with a straight seaward margin. The island is about half a mile wide and has sand dunes as high as 50 feet above sea level. Two backshore terraces can be observed, one slightly above the other. Martens (1931) considered them to have been generated by storms.

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The sand and mud sediments of the Pensacola Bay system were deposited as a result of erosion throughout the watershed that has taken place since the Pleistocene Epoch. During the Pleistocene, the Citronelle deposits were reworked and intermixed with marine terrace deposits (Marsh, 1966). These marine deposits, as well as Miocene and Pleistocene terrace deposits, are now eroding and, therefore, control the mineralogy of the bay sediments. Because each of the streams passes largely through Neogene Coastal Plain formations, the bay's sediments consist almost entirely of sand, silt, and clay eroded from these older units (George, 1988). The annual sediment load estimated by the National Ocean Service (1987) is 1.08 million tons/year, and its sediment inflow is 154.5 tons/year/square mile of drainage area.

The mineral suite for the Pensacola Bay system is made up of largely reworked, stable, heavy minerals dominated by zircon, tourmaline, staurolite, and kyanite. Unstable heavy minerals, such as hornblende, garnet, pyroxene, and epidote are essentially lacking. Clay mineral analyses indicate that the Escambia River carries mainly kaolinite, with lesser amounts of montmorillonite, vermiculite, illite, and gibbsite (Isphording et al., 1989). The deposition of sediments in the Pensacola Bay system has significantly changed over recent time. This change is partially described from borings made by the Florida Department of Transportation during construction of local bridges (Horvath, 1968). Borings were taken at the Santa Rosa Bridge near Navarre (17 borings to 65 feet), Pensacola Bay Bridge (6 borings from 100 to 108 feet), Escambia Bay Bridge (27 borings from 100 to 130 feet), and Blackwater Bay Bridge (12 borings to 65 feet).

Borings generally indicate a vegetative, "muck" layer as deep as 60 feet with cleaner fine to coarse sands below. These deposits are vegetative evidence of plant growth at a lower stand of sea level (approximately 6,000 years ago). All contain intermittent layers of silt and clay. The changes in the sedimentary regime of the system are primarily due to the geologically recent rise in the sea level. The presence of silty clays, similar to the central bay floor sediment today (in bore holes from Santa Rosa Sound), suggests that the present sediments were deposited on baylagoon deposits behind late Pleistocene barrier islands further off shore. The transition from probable bay sediments below, to barrier island lagoon sediments above (muck), occurs at about 55 feet below sea level.

~~The small sand mining and oil and natural gas operations are subject to County land development regulations and permitting requirements. County policy provides for these regulations in its policy to allow extraction of minerals only in areas where it is compatible with adjacent land uses and minimal degradation will occur. Extraction is also prohibited in environmentally sensitive areas that cannot be restored. Mining and excavation are also prohibited in Conservation/Recreation areas.~~

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6.3.3 ~~A.5~~ General Soils and Soil Resources

The term, soil, is typically applied to weathered surface layer of sediment materials. The General Soils Map of Santa Rosa County shows 48 soil types arranged in 36 soil series. Soils are depicted on **Map 6-1** by relative drainage ability. ~~Soils are also~~

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Map 4-1 found within the supporting documentation for the Infrastructure Element provides general soil suitability for septic tanks or on site sewage disposal systems. This map ~~inversely~~ coincides with Map 6-1, with well drained soils being more appropriate, and is ~~This is~~ an important parameter for gaging development related environmental impacts.

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6.3.3.1 Soil Erosion Problem Areas

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Water related soil erosion is not a major problem in Santa Rosa County due to the predominance of fine silica sand and loamy soils and gently to moderately sloping topography. The Troup soil series has a slope of 0-35 percent, the steepest slope in the County; the Lakeland soil series has a 0-30 percent slope; and the Dothan soil series has a 0-12 percent slope. All the other soil series in the County have slopes that

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range from 0-8 percent. The location of these soil series is depicted on the Future Land Use Map Series entitled Soils Map.

Soil erosion from rapid run-off can occur on sloping locations where natural vegetation cover has been removed during a land development action. Improper grading of a land development can also result in soil erosion following unusually heavy rainfalls. Water related soil erosion results in the transportation of sediment fines into stream courses and receiving water bodies. When receiving water bodies are upland depressions, the eventual effect is a filling and gradual build-up of the bottom of the depressional area. The potential significance of this type of occurrence must be evaluated on a case-by-case basis.

When water related soil erosion occurs, excessive amounts of sediments can be transported to receiving water bodies. While the transport of sediments to receiving waters is a primary source of nutrients necessary to sustain water area biological productivity, excessive amounts of sediments have detrimental effects upon the receiving water body.

6.3.3.1~~,~~2 Soil Resource Protection

The County manages potential development-related soil erosion problems through the Land Development Code, which regulates- stormwater from development. ~~T~~These potential problems are manageable. Temporary soil containment measures are now required in areas susceptible to water related erosion during project construction. Permanent drainage facilities designed to reduce the rate and volume of run-off provide for sediment containment and can control potential soil erosion from developments.

~~he~~The County's standard to retain the first 1-inch of stormwater on site is twice the amount required by the Water Management District. In addition, the County requires grassing and mulching to protect the receiving body of water against erosion, siltation, and rivulets caused by surface run-off. Soil erosion techniques are also incorporated by the Water Management District in their review of developments under their management and storage of surface water and stormwater rules.

The small sand mining and oil and natural gas operations are subject to County land development regulations and permitting requirements. County policy provides for these regulations in its policy to allow extraction of minerals only in areas where it is compatible with adjacent land uses and minimal degradation will occur. Extraction is also prohibited in environmentally sensitive areas that cannot be restored. Mining and excavation are also prohibited in Conservation/Recreation areas.

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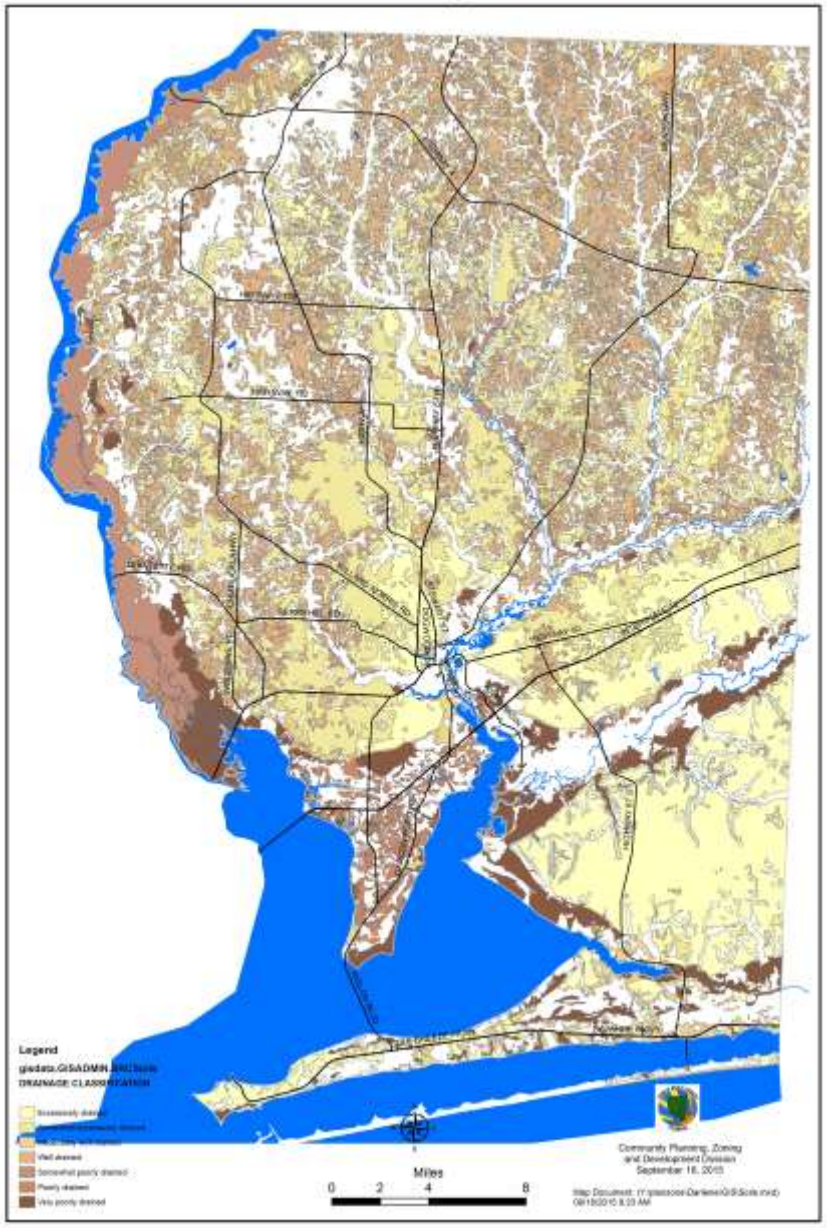
Map 6-1 Soils Map by Drainage Classification
Santa Rosa County, Florida



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~~INSERT MAP 6-1 GENERAL SOILS MAP~~

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~~the Future Land Use Map Series, General Soils Map.~~

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~~Protects air quality.~~

~~b. Conserves, appropriately uses, and protects the quality and quantity of current and projected water sources and waters that flow into estuarine waters or oceanic waters and protect from activities and land uses known to affect adversely the quality and quantity of identified water sources, including natural groundwater recharge areas, wellhead protection areas, and surface waters used as a source of public water supply.~~

~~c. Provides for the emergency conservation of water sources in accordance with the plans of the regional water management district.~~

~~d. Conserves, appropriately uses, and protects minerals, soils, and native vegetative communities, including forests, from destruction by development activities.~~

~~e. Conserves, appropriately uses, and protects fisheries, wildlife, wildlife habitat, and marine habitat and restricts activities known to adversely affect the survival of endangered and threatened wildlife.~~

~~f. Protects existing natural reservations identified in the recreation and open space element.~~

~~g. Maintains cooperation with adjacent local governments to conserve, appropriately use, or protect unique vegetative communities located within more than one local jurisdiction.~~

~~h. Designates environmentally sensitive lands for protection based on locally determined criteria which further the goals and objectives of the conservation element.~~

~~i. Manages hazardous waste to protect natural resources.~~

~~j. Protects and conserves wetlands and the natural functions of wetlands.~~

~~k. Directs future land uses that are incompatible with the protection and conservation of wetlands and wetland functions away from wetlands. The type, intensity or density, extent, distribution, and location of allowable land uses and the types, values, functions, sizes, conditions, and locations of wetlands are land use factors that shall be considered when directing incompatible land uses away from wetlands. Land uses shall be distributed in a manner that minimizes the effect and impact on wetlands. The protection and conservation of wetlands by the direction of incompatible land uses away from wetlands shall occur in combination with other principles, guidelines, standards, and strategies in the comprehensive plan. Where incompatible~~

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land uses are allowed to occur, mitigation shall be considered as one means to compensate for loss of wetlands functions.

2. Current and projected needs and sources for at least a 10-year period based on the demands for industrial, agricultural, and potable water use and the quality and quantity of water available to meet these demands shall be analyzed. The analysis shall consider the existing levels of water conservation, use, and protection and applicable policies of the regional water management district and further must consider the appropriate regional water supply plan approved pursuant to s. 373.709, or, in the absence of an approved regional water supply plan, the district water management plan approved pursuant to s. 373.036(2). This information shall be submitted to the appropriate agencies.

B. Vegetative Communities

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The vegetative communities within Santa Rosa County are shown on Map 11-1 (Appendix A). The following descriptions cover some of these vegetative communities and provides the Florida Land Use, Cover Classification System designations for these communities:

Cropland and Pastureland (FLUCCS 2100). These areas include cropland harvested or land from which crops are harvested other than tree and bush crops and horticultural crops, lands on which crops and pasture grasses are grown in rotation with one another, and pastureland used more or less permanently for livestock grazing.

Shrub and Brushlands (FLUCCS 3200). This category includes saw palmettos, gallberry, wax myrtle, coastal scrub and other shrubs and brush. Generally, saw palmetto is the most prevalent plant cover intermixed with a wide variety of other woody scrub plant species as well as various types of short herbs and grasses. Coastal scrub vegetation would include pioneer herbs and shrubs composed of such typical plants as sea purslane, sea grapes and sea oats without any one of these types being dominant.

Upland Forest (FLUCCS 4000). This category of land cover is reserved for those upland areas that support a tree canopy closure of 10 percent or more. The Upland Forests include both the xeric (dry site) and mesic (moderately moist site) forest communities. Wetland, or hydric, forest communities fall under the broad wetland category. Also included in the Upland Forest category are areas in which timber harvesting has occurred but which exhibit no evidence of being developed for other intended uses (clear-cuts in an area in which rotation forest management is practiced is a prime example).

Wetland Forested Mixed (FLUCCS 6300). This category includes mixed wetlands forest communities in which neither hardwoods nor conifers achieve a 66 percent dominance of the crown canopy composition.

Sand Other Than Beaches (FLUCCS 7200). Sand other than beaches is usually in reference to dune sands. These are of aeolian origin and composed of sand grains downwind from a natural source of sand. Dune sizes vary greatly with diameters ranging from a few feet to more than several hundred feet. Their heights also vary and their shapes display considerable variety. When the dunes are the major feature, shore and strand lines, coastal plains, river flood plains and deltas are secondary. This category is not restricted to dune sands as bare sands exist in other forms.

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Disturbed Land (FLUCCS 7400). Disturbed lands are those areas that have been changed due primarily to human activities other than mining. In Florida, these areas may be rather extensive and often appear outside of urban areas.

Grassy Scrub (FLUCCS 310, Herbaceous). This FLUCCS category includes grasses that occur on the upland margin of wetlands usually between the marsh and the upland forest area. These areas may be periodically flooded with water, and are usually treeless. Primary vegetation includes grasses, sedges, rushes, and herbs. In some of the dryer areas, wiregrass and palmetto are common.

Typical wildlife includes bobcat, deer, fox, rabbit, opossum, raccoon, bobwhite, cranes, egrets, herons, ibis, meadowlark, hawks, and snipe. These areas are commonly used for rangelands and pasture lands. Listed species in this vegetative type include the following:

Amphibians	Florida Gopher Frog
Reptiles	Gopher Turtle
Birds	Florida Crane, American Kestrel, Grasshopper Sparrow, Swallow-tailed Kite

Sandhill Community (FLUCCS 412, Longleaf Pine, Xeric Oak). The primary forest type in this community is longleaf pine trees, with a mixture of hardwoods as understory. The community is characteristic of deep, infertile, sandy type soils. The pines are usually of poor quality and irregularly stocked.

This community is suited for deer, turkey and several varieties of birds. Timber harvesting and similar disturbances improve food production of this community by increasing the amount and types of herbaceous plants and sprout production. Listed species include the following:

Amphibians	Florida Gopher Frog, Gopher Tortoise
Reptiles	Sand Pine Lizard, Gopher Tortoise
Birds	Red-cockaded Woodpecker, American Kestrel
Plants	Florida Bonamia, Godfrey's Blazing Star, Pigmy Fringetree

Xeric Hammock (FLUCCS 421, Xeric Oak). This community occupies the same area as longleaf pine, however, pine is not the dominant community. The oak community dominates. Longleaf pine may have been dominant at one time, but due to harvesting, it has declined and xeric hammock has increased. Common vegetation species include bluejack oak, turkey oak, and post oak.

Primary animal species include raccoon, opossum, southern squirrel, fox, bobcat, deer, and armadillo. Many different types of birds exist in this community. Listed species include the following:

Amphibians	Florida Gopher Frog
Reptiles	Eastern Indigo Snake, Florida Pine Snake, Gopher Turtle, Scrub Pine Lizard
Birds	Florida Grasshopper Sparrow
Mammals	Black Bear, Florida Mouse
Plants	Dwarf Spleenwort, Ebony Spleenwort, Florida Bonamia, Godfrey's Blazing Star, Pigmy Fringetree, Pigmy Pipes, Tiny-leaved Buckthorn

Bayheads and Bogs (FLUCCS 611, Bay Swamps). This category is composed of loblolly, bay, sweetbay, red bay, swamp bay, and slash pine. Understory includes gallberry, fetterbush, and wax myrtle. This community may appear as an open expanse of grasses, sedges, and rushes.

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These areas support a wide variety of wildlife, including bear, deer, squirrel, turkey, raccoon, wading birds, and reptiles. These wetlands primarily provide cover for these animals during escape and during breeding. Listed species in this community include the following:

Amphibians	Pine Barrens Tree Frog
Mammals	Black Bear
Plants	Chapman's Rhododendron, Harper's Beauty

Rivers and Streams (FLUCCS 510, Streams and Waterways). According to the FLUCCS 500 category Open Water, the delineation of water depends on the size and scale of the water body. Water bodies with emergent vegetation or known submerged vegetation are categorized as wetlands and defined in the 600 category. The Rivers and Waterways category includes rivers, creeks, canals, and other linear water bodies where the boundary is less than one mile across. There are no major springs in Santa Rosa County.

Lakes and Ponds (FLUCCS 520, Lakes). The lakes category includes large inland water bodies, excluding reservoirs. There are many lakes within the County. The largest lake is Bear Lake within the Blackwater River State Forest, which comprises 109 acres.

Marine Resources (FLUCCS 540). Saline and Coastal Plankton Estuaries: Bays and estuaries are inlets of the ocean that extend into the land area. Saline and coastal plankton estuaries lie on the subtidal and intertidal area of the ocean. Large vegetation species have not adapted to this area; however this area provides habitat and food sources for fish, invertebrates, wading birds, and waterfowl. Plankton, an organic species that drifts and floats with the tides, provides food for these species.

Embayments (FLUCCS 5410 and 5420). *Em*bayments are more than one nautical mile in width and open either directly or indirectly into the Atlantic Ocean or the Gulf of Mexico.

Borrow Pit (FLUCCS 742). FLUCCS categorizes borrow pits as disturbed lands due to excavation, mining, and other human activities which have scarred the natural landscape. These areas are usually converted into lakes as water fills the pit.

Tidal Flat (FLUCCS 651, Tidal Flat). This category is composed of the shore area protected from wave action. Tidal flats alternate between the cycle of submergence and exposure to the atmosphere. These areas appear as large areas of grass with interconnected channels or streams cut throughout. Vegetation is affected by water level. Primary plants include herbaceous plants, and grasses and grass like plants.

These areas support a large variety of wildlife. Primary species include deer, otter, raccoon, birds, waterfowl, seabirds, and several reptiles. Tidal flats provide good habitat for these species. Habitat is normally maintained by wave action, wind, and storm influence. Storms usually cause the creation of open water in salt and brackish marshes that affects the habitat during this time, allowing it to be favorable to some species while displacing others. The following listed species may be found in this community:

Reptiles	American Alligator, Atlantic Green Turtle, Atlantic Hawksbill Turtle
Birds	Bald Eagle, Cape Sable Seaside Sparrow, Kirtland's Warbler, Least Tern, Roseate Tern, Wood Stork
Mammals	West Indian Manatee

Beach and Dune (FLUCCS 710-720, Beaches and Sand). The beach and dune coastal strand vegetative associations are restricted to high-energy shorelines along the seaward boundary of the spits and barrier islands of Panhandle Florida. The only barrier islands in this Region are the Santa Rosa and Shell Islands. A large spit in our Region is Crooked Island. Coastal marshes and salt flats found along low-energy

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coastlines are not considered components of the strand community, nor are the upland communities, such as pine flatwoods found inland of the dune system and along shorelines being eroded by the sea.

Soils of the coastal strand, as the beach and dune systems are often called, are sandy, grading from unsorted, mixed grain sizes and shells thrown up as berms by storms to finely graded and sorted grain sizes on aeolian dunes. These latter dunes occur perched on the interdune flats or are developed on top of the berms thrown up by storms. Though variable from site to site, dune and beach vegetation can have three distinguishable zones: (1) the shifting beach sands; (2) the produne vegetation; and (3) the scrub zone (An Ecological Characterization of the Florida Panhandle, 138).

The shifting beach sand zone is, by definition, devoid of living, rooted vegetation. The primary energy sources for the often numerous consumers that frequent this zone are imported by wind and wave action or brought down from more inland areas (An Ecological Characterization of the Florida Panhandle, 138). Seagrass washed onto the shoreline by storm tides and waves, drifting plant debris, shells, and carcasses of fish and other marine life, collectively called seawrack, serve as food for the primary consumers that include many insects and their larvae, amphipods, ghost crabs, and other burrowing invertebrate species (Ibid., 138). These, in turn, provide food for gulls, terns, and probing Shorebirds.

Inland from the shifting beach sand zone, the produne is the first large dune. Produne vegetation is characterized by pioneer plants that can establish themselves in the shifting, arid sands and tolerate salt spray and intense heat. Examples include sea oats (*Uniola paniculata*), railroad vine (*Ipomoea pes-caprae*), beach morning glory (*I. stolonifera*), evening primrose (*Oenothera humifusa*), sand spur (*Cenchrus tribuloides*), grasses (*Paspalum vaginatum*, *Schizachyrium martitimum*, *Panicum amarum*), sand cocograss (*Cyperus lecontoi*), and sea purslane (*Sesuvium portulacastrum*) (Ibid., 138). The produne provides limited protection to the interior dune system from wind and salt spray and is crucial for the establishment of subsequent plant communities. On the backsides of these dunes Spanish bayonet (*Yucca aloiflia*), myrtle oak (*Quercus myrifolia*), green brier (*Smilax auriculata*), saw palmetto (*Serenoa repens*), and other plants characteristic of the interior dunes may grow (Ibid., 138).

Farther inland from the foredunes is the "scrub" zone, characterized by stunted, wind and salt spray pruned scrubby oaks and other evergreen, small leaved shrubs. This area is referred to as the "scrub" zone by Kurz (1942), because of its similarity to scrub oak growing on relict sand dunes of interior Florida (Ibid., 138). The scrubby, gnarled, thickleaved evergreen oaks that are characteristic of the scrub community include sand live oak (*Q. chapmanii*), fetterbush (*Lyonia lucida*), and very rarely in the Panhandle, myrtle oak (*Quercus myrtifolia*). Other common shrubs include different types of rosemary (*Ceratiola ericoides*, *Conradina canescens*) and gopher apple (*Licania michauxii*). Ground cover is usually sparse, leaving large patches of bare white sand with reindeer moss (*Cladonia rangifera*) and other lichens. The scrub community is typically two layered, with slash or sand pine in the canopy and the scrub oaks and shrubs in the understory (Ibid., 138).

Scrub communities are quite variable. The coastal scrub forest is dominated by a mixture of sand and slash pine in most locations. Sand pines are less tolerant of salt spray than slash pine. Thus, it is common to find sand pine on the interior dunes or bayside beach ridges and dunes on the Panhandle's barrier islands. Across the lagoon, where sand pine is better sheltered from heavy winds and salt spray, it occurs in dense stands on relict dunes and beach ridges along the continental margin. Eglin Air Force Base is noted for a variety of sand pine having open, rather than serotinous cones, such as the sand pine has in central Florida.

Open areas of the scrub zone are sometimes occupied by lichens, St. John wort (*Hypericum reductum*), nettles (*Cnidoscolus stimulosus*), stunted sea oats, and Jointweed (*Polygonella polygama*) (An Ecological

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~~Characterization of the Florida Panhandle, 139). Swales between dunes may occasionally retain water after heavy rains. These shallow interdunal depressions may be distinguished from sloughs in that they drain runoff vertically into the soil, whereas sloughs hold surface runoff or carry it into the bay (Ibid., 139).~~

~~The vegetation of the coastal community is subjected to harsh conditions. High winds, shifting sands, intense heat, and salt spray are chronic stress factors that define not only species composition, but growth forms as well. Many plants found in the coastal region appear to be gnarled and stunted, perhaps as adaption to or consequences of environmental stress (Ibid., 139).~~

~~The dunes are so arid and hot that few amphibians can tolerate the severely stressful conditions. Southern toads (*Bufo terrestris*) occasionally take refuge in burrows and forage at night at the base of dunes, especially in the interdune flats. Toads can be abundant in coastal strand environments as can the southern leopard frog (*Rana sphenocephala*) because both breed in temporary ponds of the interdune flats (Ibid., 140). Coastal strand environments have a bounty of reptiles. Reptiles are the vertebrates best adapted for this environment. Their food source (insects, small vertebrates) are very abundant in the highly productive coastal habitats. The garter snake (*Thamnophis sirtalis*), black racer (*Clouber constrictor*), coachwip (*Masticophis flagellum*), cottonmouth (*Agkistrodon piscivorus*), and pygmy rattlesnake (*Sistrurus miliarus*) are also exceedingly abundant along strands. Mammals of the coastal strand include the eastern mole (*Scalopus aquaticus*), shrews, beach mice (*Peromyscus polionotus sbspp.*), rice rat (*Oryzomys palustris*), cotton rat (*Sigmodon hispidus*), cottontail (*Sylvilagus floridanus*), and marsh rabbit (*S. palustris*) (Ibid., 140).~~

~~Coastal scrub communities from Santa Rosa Island to St. Joe Spit have populations of light colored beach mice that burrow in the sand. These, cotton rats, and rice rats probably are eaten by the coachwip and black racer, common snakes in the scrub that actively hunt their prey. They also eat the six-lined racerunner (*Cnemidophorus sexlineatus*), a common scrub vertebrate. Southern toads are the most common frog, but the southern leopard toad is also abundant. Many animals encountered in scrubs are visitors from adjacent wetlands, forests, or grassland vegetation. Two federally listed endangered subspecies, the Choctawhatchee beach mouse (*Peromyscus polionotus allophnys*) and Perdido Key beach mouse (*P. polionotus trissyllopsis*) are found on some of these barrier islands (Ibid., 140).~~

~~The marine sandy beaches in the Panhandle are located on the gulfward-facing shores of the barrier islands (Shell and Santa Rosa Islands) and on the mainland shores from Cape San Blas to Pensacola. These intertidal habitats experience the highest wave energy of any habit type in the Panhandle saltwater environment. This beach habitat includes the swash zone (the sloping surface of the beach face created by the runnup of water) down to the mean low water mark (MLW) (An Ecological Characterization of the Florida Panhandle, 228).~~

~~Panhandle beach sediments are composed almost exclusively of fine quartz grains with a median diameter of 0.1 to 0.2 mm (Ibid., 228). Their extreme white color makes them attractive to residents and tourists. The aerobic zone (i.e., depth of oxygenated sediment) in beach sediments is very deep because of tidal flushing and the relatively large interstitial pore spaces (Ibid., 228). This allows organisms to live far down within the sediment and escape the pounding waves. Most beach organisms are suspension feeders, using the rushing water to constantly carry food in and waste material away (Ibid., 228).~~

~~Estuarine beaches are the areas that border sounds, bays, lagoons, and bayous. Basically, they are the areas that are inland from open water such as the Gulf of Mexico. As the above definition for estuary states, they have a mixture of salt and freshwater and very little actual "beach." Very little sand will be seen on these beaches. Grasses and other aquatic plant life covers the "beach" area. Estuarine beaches are the next area in from a marine beach. They are between aquatic and inland areas.~~

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~~C~~6.3.4. ~~Wildlife Resources~~Natural Habitat / Wildlife Resources

Santa Rosa County shares with the rest of northwest Florida a number of different habitat areas suitable for wildlife. Wildlife habitats correspond to vegetated communities. Formerly, all of Santa Rosa County was open to the easy movement of wildlife requiring large foraging areas. As these areas have declined with development, wildlife populations have been reduced. The availability of wildlife corridors, either as constructed travel routes or preserved natural areas, will permit some reduced level of persistence of adaptable wildlife species.

6.3.4.1 ~~Publicly Owned~~ Conservation Lands in Santa Rosa County

Goal 9 of the Florida State Comprehensive Plan states that Florida "shall protect and acquire unique natural habitats and ecological systems, such as wetlands, tropical hardwood hammocks, palm hammocks, and virgin longleaf pine forests, and restore degraded natural systems to a functional condition". Achieving this goal requires the cooperation of the County with other agencies in the identification and preservations of unique areas. This may include conservation easements, land grants from private citizens, a land trust, or the purchase of land through public organizations such as Florida Forever. Florida Forever is Florida's premier conservation and recreation lands acquisition program, a blueprint for conserving natural resources and renewing Florida's commitment to conserve the state's natural and cultural heritage. Florida Forever replaced the Preservation 2000 (P2000), the largest public land acquisition program of its kind in the United States.

Substantial areas of floodplain and wetland in the watershed, were acquired and protected in Santa Rosa County via the Save Our Rivers and Preservation 2000 programs. In particular, the NWFWMD has purchased 56,780 ~~53,890~~ acres of land along the Escambia and Yellow Rivers, in Escribano Point and within the Garcon Point peninsula. **Map 6-2** shows all publicly owned lands in Santa Rosa County and includinges those lands that are designated as Conservation / Recreation on the Future Land Use Map and as well as privately held conservation lands within Santa Rosa County. The following summarizes the amount of conservation land within Santa Rosa County. In total, approximately 39% of the County land area is comprised of either military or conservation land uses.

- 177,767 acres of land

~~INSERT TABLE~~

- designated as Conservation Recreation on the Future Land Use Map (FLUM) which is 27% of total County land area;
- 184,554 acres of publicly owned lands (State, Federal, Santa Rosa County & City) which is 28% of total County Land Area and includes those lands designated as Conservation on the FLUM above;~~=~~
- 1,523.86 acres of ~~P~~private ~~C~~ conservation ~~L~~lands (Garcon Point Mitigation Bank, LLC ~~&~~ Westervelt) which is not included in those lands designated Conservation on the FLUM above; and ~~= 1,523.86 acres~~

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- 72,460 acres of ~~M~~Department of Defense owned lands~~ilitary Owned Lands~~ (Eglin, NAS Whiting Field) ~~=~~ which are designated as Military on the FLUM but include the Eglin Preserve. Eglin AFB covers 464,000 acres in Santa Rosa, Okaloosa, and Walton counties and includes the Eglin Wildlife Management Area. An Eglin permit is required to access the 250,000 acres of the Eglin reservation conditionally open to public recreation. ~~72,459.89 acres~~

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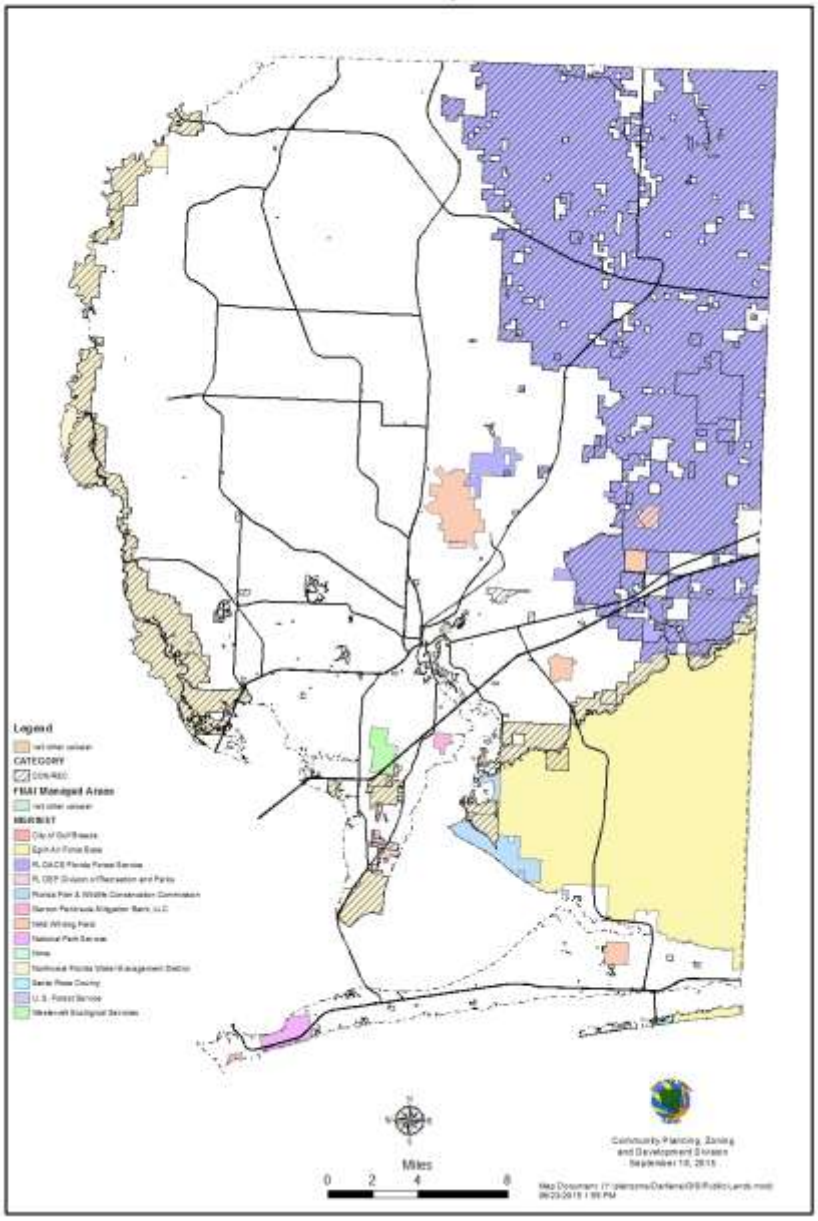
Map 6-2 Publily Owned Lands
Santa Rosa County, Florida



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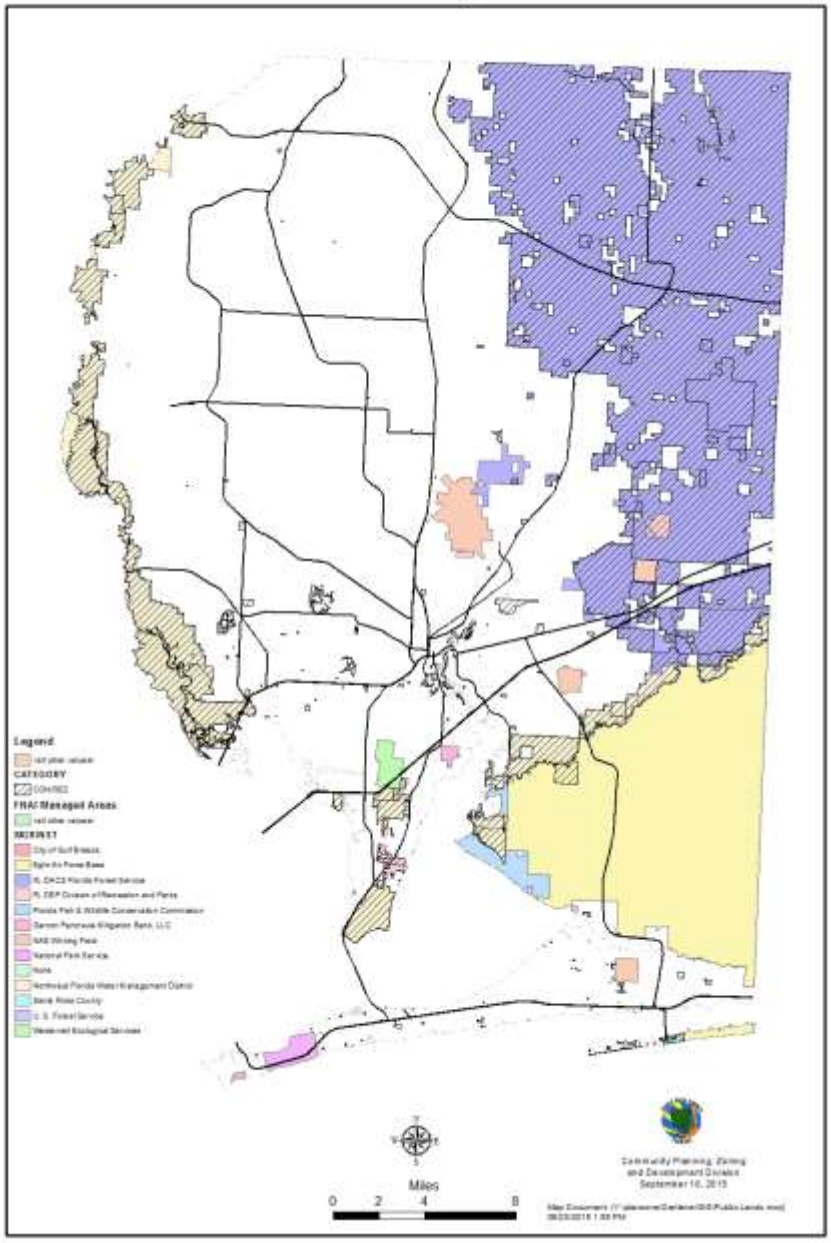
Map 6-2 Publily Owned Lands
Santa Rosa County, Florida



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~~INSERT MAP 6-2 PUBLICLY OWNED LANDS and CONSERVATION/RECREATION~~

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~~6.3.4.2 Florida Natural Areas Inventory (FNAI) and FWCC~~

~~The Florida Natural Areas Inventory (FNAI) provides listings of the presence of listed species within the County. The inventory was established to aid in the protection of listed species and should be recognized by the County in land use and land acquisition decisions. In addition to this inventory, the Florida Fish and Wildlife Conservation Commission publishes an official list of endangered and potentially endangered fauna and flora in Florida.~~

~~How do we use these….~~

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6.3.4.~~3~~2 Closing the Gaps

In 1994, researchers from the Florida Fish and Wildlife Conservation Commission (FWC) completed a report, entitled Closing the Gaps in Florida's Wildlife Habitat Conservation System (Cox et al., 1994), assessing the security of rare and imperiled species on existing conservation lands in Florida. The biologists that authored this report used species occurrence data, habitat data, and the analytical capabilities of Geographic Information Systems (GIS) to assess the protection afforded to 62 focal species on lands managed for conservation and to identify important habitat areas in Florida that have no conservation protection. These areas, known as Strategic Habitat Conservation Areas (SHCA), depict areas needed for protection and serve as a foundation for conservation planning in Florida. Since 1994, landscape-level habitat changes, transfer of land from private to public ownership, and changes in land use have reduced the appropriateness of using Cox et al.'s (1994) findings to accurately assess Florida's current biodiversity and wildlife conservation status. In 2009, the Fish and Wildlife Research Institute completed and update titled, "Wildlife Habitat Conservation Needs in Florida: Updated Recommendations for Strategic Habitat Conservation Areas"

The GAP report identified several large concentrated Strategic Habitat Areas in Santa Rosa County. Please refer to **Map 6-3** for these locations as updated by the 2009 report mentioned above. The established Strategic Habitat Areas are particularly important to the County as natural resources which not only attract tourists, but also creates an environment that is consistent with a sustainable community atmosphere. Eco-tourism should be considered an economic resource that communities must pay more attention to in the future.

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In addition, the GAP report also identified Biodiversity Hot Spots in the County. Please refer to **Map 6-4** for these locations. These maps are utilized for environmental analysis of large scale amendments to the Comprehensive Plan's Future Land Use Map.

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~~INSERT Maps of wildlife areas, flora and fauna along with summary~~

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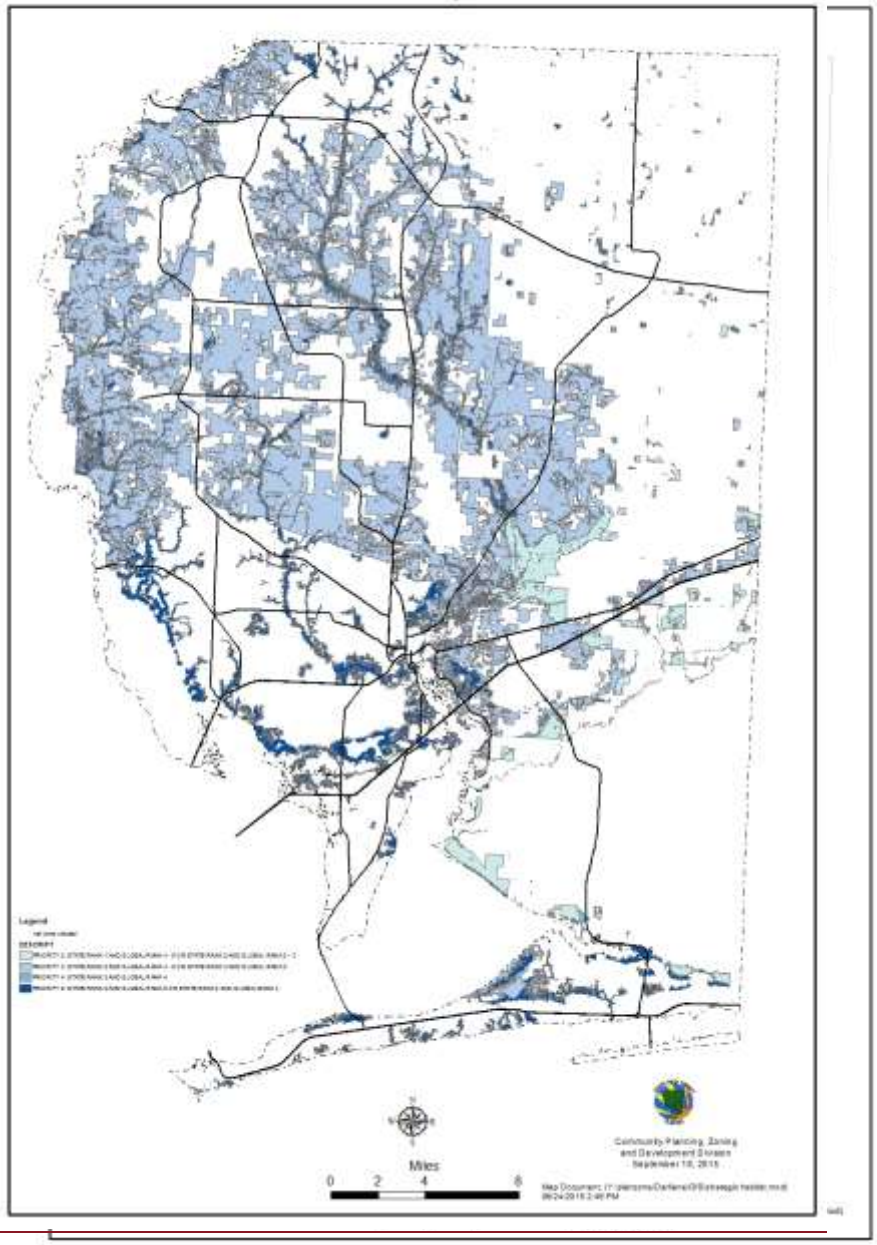
Map 6-3 Strategic Habitat Areas
Santa Rosa County, Florida



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~~INSERT MAP 6-3 Strategic Habitat Areas Map~~

~~Most of the surface waters in Florida fall into Class III by default. This is the "fishable, swimmable" level of protection required by the Clean Water Act.~~

~~TMDLs are developed for waterbodies that are not meeting their designated use for certain water quality parameter(s), such as fecal coliforms. The TMDL is designed to restore the waterbody to fully meet its designated use once the TMDL is implemented (usually through the Basin Management Action Plan (BMAP)).~~

~~On the other hand, OFWs are a part of the state's antidegradation policies and are implemented through permitting. The intent of an OFW designation is to preserve ambient water quality and prevent it from being lowered. I have attached several OFW factsheets that go into this a bit more. You can have a waterbody that can be Classes I through III and also be an OFW. They are separate from each other.~~

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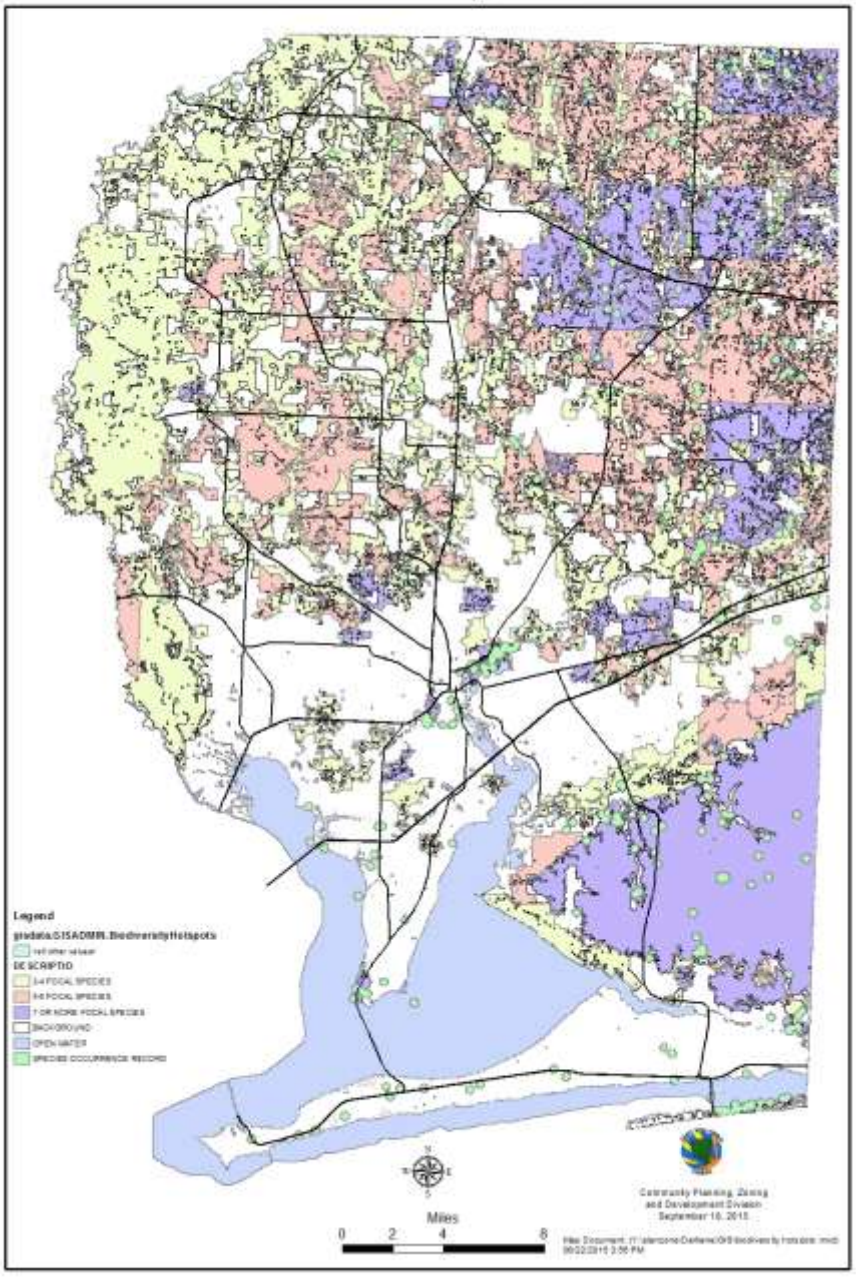
Map 6-4 Biodiversity Hot Spots
Santa Rosa County, Florida



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~~INSERT MAP 6-4 Biodiversity Hot Spots Map~~

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6.3.4.4 Gulf Coastal Plain Ecosystem Partnership

~~Santa Rosa County shares with the rest of northwest Florida a number of different habitat areas suitable for wildlife. Wildlife habitats correspond to vegetated communities. Formerly, all of Santa Rosa County was open to the easy movement of wildlife requiring large foraging areas. As these areas have declined with development, wildlife populations have been reduced. This is why it is necessary for the County to identify the wildlife areas that need to be preserved, establish regulations and/or other wildlife conservation and preservation techniques. . The availability of wildlife corridors, either as constructed travel routes or preserved natural areas, will permit some reduced level of persistence of adaptable wildlife species.~~

Santa Rosa County has benefited from the development of the Gulf Coastal Plain Ecosystem Partnership (GCPEP). The (GCPEP), formed in 1996 via a Memorandum of Understanding, launched a joint planning process to identify conservation goals and actions, and to provide buffers for military lands. Non-government partners such as the Nature Conservancy have contributed funds and office space, and have provided volunteers, public outreach, and other services.

The Gulf Coastal Plain Ecosystem Partnership recently expanded, and now covers more than one million acres (**Map 6-~~2~~5**). It is working to increase buffers around military reservations, improve biodiversity management, and assure green space and recreation opportunities for the region. Its activities include:

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- Participating in the "Florida Greenways Project," a multi-agency/organization initiative that is working to create a greenway from the Gulf of Mexico south of Tallahassee through Eglin AFB, NAS Pensacola, and NAS Whiting Field to Ocala National Forest further south.

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- Completed land deals that have protected tens of thousands of acres immediately adjacent to the three DoD installations.

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- Supported scientific workshops to develop a regional strategic conservation plan.

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- Created an Ecosystem Support Team for on-the-ground management. The team conducts ecological monitoring of key natural communities, has assisted with more than 39,000 acres of prescribed burning on GCPEP lands, and helped the partners with Hurricane Ivan relief.

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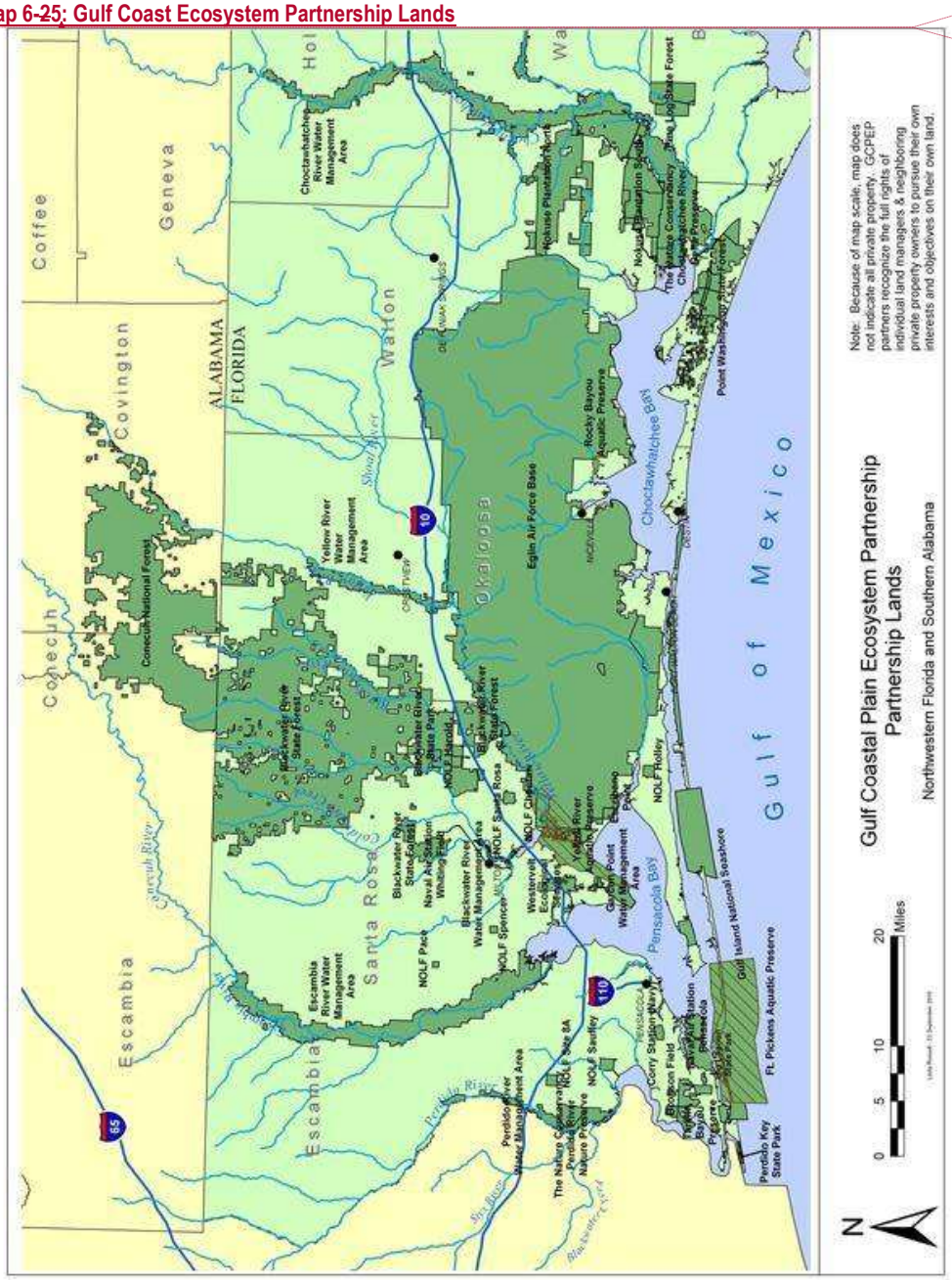
Map 6-25: Gulf Coast Ecosystem Partnership Lands



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M.5 Natural Habitat Protection

Goal 10 of the State Land Development Plan provides for the protection and acquisition of unique natural habitats and natural systems. This goal also includes the restoration of degraded natural systems to a functional condition. Achieving this goal requires the cooperation of the County with other agencies in the identification of unique areas. The County should pursue means in which to protect natural habitats and systems. This may include bond purchases, land grants from private citizens, a land trust, or the purchase of land through public organizations such as the CARL program or Preservation 2000/Florida Forever. Substantial areas of floodplain and wetland in the watershed, have been acquired and protected via the Save Our Rivers and Preservation 2000 programs. In particular, the NWFWMD has purchased 53,890 acres of land along the Escambia and Yellow Rivers, in Escribano Point and within the Garcon Point peninsula.

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The Florida Natural Areas Inventory (FNAI) provides listings of the presence of listed species within the County. The inventory was established to aid in the protection of listed species and should be recognized by the County in land use and land acquisition decisions. In addition to this inventory, the Florida Fish and Wildlife Conservation Commission publishes an official list of endangered and potentially endangered fauna and flora in Florida.

Important wildlife habitats throughout the County, which can be linked together to create corridors, should be identified, protected, conserved and regulated. Other appropriate agencies should be consulted for the identification and study of these areas.

The Florida Fish and Wildlife Conservation Commission (previously the Florida Game and Freshwater Fish Commission) has designated Coastal Maritime Hammock, Xeric Oak Scrub, and Longleaf Pine/Wiregrass as unique upland communities. These three communities are threatened and provide habitat for endangered and common species.

The coastal hammocks are found along riverbanks in addition to ocean areas. Sandhill communities contain long leaf pine with a hardwood understory. Long leaf pine communities provide habitat to a wide variety of wildlife. At this time, the uplands are not afforded the same type of protection as the wetlands. These upland areas are highly developable and therefore have development pressures imposed upon them.

In an effort to address the declining environmental trend, the State Legislature in 1993 merged the Department of Environmental Regulations (DER) and Department of Natural Resources (DNR) into the Department of Environmental Protection (DEP). After these two agencies were merged into one, DEP was charged with the responsibility of developing a strategy to protect the functions of the entire ecological system. So through the public participation process of over 300 Florida citizens, private parties, local governments, State governmental agencies, and some Federal governmental agencies, development of concepts to create an integrated environmental permitting system took place. Thus, Ecosystem Management came into being. Ecosystem Management bases its philosophies on environmental principles which recognize that all living things are clearly interconnected and cannot be managed in isolation from one another. This is not a new concept, but one that has been around for a long time and is well understood by many scientists and various environmental land managers.

What is revolutionary about Ecosystem Management is the way DEP plans to implement these philosophies. In the past, all too frequently, local governments reviewed development plans on a case-by-case basis limited by the boundaries of the specific project. Projects were not reviewed considering the "big picture" or considering the overall ecological perspective. Furthermore, a vehicle was not provided to

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support the conservation and preservation of regional ecological systems. Now, a vehicle is being provided through Ecosystem Management.

Ecosystem Management's philosophies are defined by their over riding theme of ***stewardship of the land*** and their central focus is Place-Based Management. These management concepts encourage innovative, cooperative solutions to environmental problems through the involvement and cooperation of all of Florida's citizens, not just the government. DEP defines ***stewardship of the land*** as a strong sense of ownership in and responsibility for Florida's land, air, water and other resources by all of Florida's residents. Place-Based Management focuses on an area or place of sufficient size to address major hydrological and ecological connections on a regional scale.

As stated before, Ecosystems Management depends on the involvement and cooperation of all of Florida's citizens, not just the government. Ecosystem Management encourages innovative and cooperative solutions to environmental problems, accountability in the decision making process, better integration of governmental and private programs, and the dismantling of institutional barriers in an effort to promote wise stewardship of Florida's natural and cultural resources.

DEP has identified regional Ecosystem Management Areas (EMA) throughout Florida. Ecosystem Management Areas (EMA) are defined by drainage basins or watersheds that are hydrologically and ecologically connected and are of environmental significance. Currently, there are no Ecosystem Management Areas identified in northwest Florida.

In the new era of cooperation between all levels of government identified as having common goals, the Florida Fish and Wildlife Conservation Commission (previously FGFWFC) in cooperation with DEP and FNAI have published a revolutionary environmental publication entitled Closing the Gap in Florida's Wildlife Habitat Conservation System (here by referred to as the"GAP"). This publication, as its name implies, fills the GAP by identifying those areas not already conserved through any other conservation techniques necessary to sustain wildlife bio-diversity.

Today, many animals are caught in a state of siege as habitats needed to sustain wildlife populations are rapidly disappearing. This publication identifies areas referred to as Strategic Habitat Conservation Areas, visually identifying (through the GIS system) habitat conservation areas throughout the State. This same information is further broken down County by County. These maps provide visual references necessary to sustain a minimum bio-diversity essential to sustain the State's rarest animals, plants, and natural communities well into the future. The Geographic Information System (GIS) was utilized to identify important habitat areas from documented occurrence records of 44 indicator species (of biological diversity) and to identify minimum habitat areas necessary to sustain these species that are not presently being protected through any other conservation techniques.

The GAP report identified several large concentrated Strategic Habitat Areas in Santa Rosa County. Please refer to Map 11-7 (Appendix A) for these locations. The established Strategic Habitat Areas are particularly important to the County as natural resources which not only attract tourists, but also creates an environment that is consistent with a sustainable community atmosphere. Eco-tourism should be considered an economic resource that communities must pay more attention to in the future.

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In addition, the GAP report also identified Biodiversity Hot Spots in the County. Please refer to Map 11-8 (Appendix A) for these locations.

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~~Table 11-1 identifies the wildlife species that occur in Santa Rosa County. As noted in the source "This is not a comprehensive list of all species and natural communities occurring in the location searched. Only element occurrences documented in the FNAI data base are included."~~

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M.5 Natural Habitat Protection

Goal 10 of the State Land Development Plan provides for the protection and acquisition of unique natural habitats and natural systems. This goal also includes the restoration of degraded natural systems to a functional condition. Achieving this goal requires the cooperation of the County with other agencies in the identification of unique areas. The County should pursue means in which to protect natural habitats and systems. This may include bond purchases, land grants from private citizens, a land trust, or the purchase of land through public organizations such as the CARL program or Preservation 2000/Florida Forever. Substantial areas of floodplain and wetland in the watershed, have been acquired and protected via the Save Our Rivers and Preservation 2000 programs. In particular, the NWFWMD has purchased 53,890 acres of land along the Escambia and Yellow Rivers, in Escribano Point and within the Garcon Point peninsula.

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The Florida Natural Areas Inventory (FNAI) provides listings of the presence of listed species within the County. The inventory was established to aid in the protection of listed species and should be recognized by the County in land use and land acquisition decisions. In addition to this inventory, the Florida Fish and Wildlife Conservation Commission publishes an official list of endangered and potentially endangered fauna and flora in Florida.

Amphibians			
Reticulated Flatwoods Salamander	Ambystoma cingulatumbishopi	Pine Barrens Treefrog	Hyla andersonii
Tiger Salamander	Ambystoma tigrinum	Gopher Frog	Rana capito
One-toed Amphiuma	Amphiuma pholeter	Florida Bog Frog	Rana okaloosae
Seal Salamander	Desmognathus monticola		
Reptiles			
American Alligator	Alligator mississippiensis	Coal Skink	Eumeces anthracinus
Gulf Coast Smooth Softshell	Apalone mutica calvata	Gopher Tortoise	Gopherus polyphemus
Loggerhead	Caretta caretta	Escambia Map Turtle	Graptemys ernsti
Green Turtle	Chelonia mydas	Kemp's ridley	Lepidochelys kempii
Eastern Diamondback Rattlesnake	Crotalus adamanteus	Alligator Snapping Turtle	Macroclemys temminckii
Leatherback	Dermochelys coriacea	Gulf Salt Marsh Snake	Nerodia clarkii clarkii
Eastern Indigo Snake	Drymarchon corais couperi	Florida Pine Snake	Pituophis melanoleucus mugitus
Copperhead	Agkistrodon contortrix	Common Kingsnake	Lampropeltis getula
Birds			
Cooper's Hawk	Accipiter cooperii	Wood Stork Black Rail	Mycteria Americana Laterallus jamaicensis
Bachman's Sparrow	Aimophila aestivalis	Yellow-Crowned Night-Heron Wood Stork	Nyctanassa violacea Mycteria Americana
Louisiana Seaside Sparrow Henslow's Sparrow	Ammodramus maritimus fisheri Ammodramus henslowii	Black-Crowned Night-Heron Yellow-Crowned Night-Heron	Nycticorax nycticorax Nyctanassa violacea
Great Egret Louisiana Seaside Sparrow	Ardea alba Ammodramus maritimus fisheri	Osprey Black-Crowned Night-Heron	Pandion haliaetus Nycticorax nycticorax
Snowy Plover Great Egret	Charadrius alexandrinus Ardea alba	Brown Pelican Osprey	Pelecanus occidentalis Pandion haliaetus
Piping Plover Snowy Plover	Charadrius melodus Charadrius alexandrinus	Red-Cockaded Woodpecker Brown Pelican	Picoides borealis Pelecanus occidentalis
Marian's Marsh Wren Piping Plover	Cistothorus palustris marianae Charadrius melodus	Hairy Woodpecker Red-Cockaded Woodpecker	Picoides villosus Picoides borealis
Little Blue Heron Marian's Marsh Wren	Egretta caerulea Cistothorus palustris marianae	Glossy Ibis Hairy Woodpecker	Plegadis falcinellus Picoides villosus
Snowy Egret Little Blue Heron	Egretta thula Egretta caerulea	Florida Clapper Rail Glossy Ibis	Rallus longirostris scottii Plegadis falcinellus
Tricolored Heron Snowy Egret	Egretta tricolor Egretta thula	Black Skimmer Florida Clapper Rail	Rynchops niger Rallus longirostris scottii
Swallow-Tailed Kite Tricolored Heron	Elanoides forficatus Egretta tricolor	Louisiana Waterthrush Black Skimmer	Seiurus motacilla Rynchops niger
White Ibis Swallow-Tailed Kite	Eudocimus albus Elanoides forficatus	American Redstart Louisiana Waterthrush	Setophaga ruticilla Seiurus motacilla

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Merlin White Ibis	Falco columbarius Eudocimus albus	Least Tern American Redstart	Sterna antillarum Setophaga ruticilla
Peregrine Falcon Merlin	Falco peregrinus Falco columbarius	Caspian Tern Least Tern	Sterna caspia Sterna antillarum
Southeastern American Kestrel Peregrine Falcon	Falco sparverius paulus Falco peregrinus	Royal Tern Caspian Tern	Sterna maxima Sterna caspia
American Oystercatcher Southeastern American Kestrel	Haematopus palliatus Falco sparverius paulus	Sandwich Tern Royal Tern	Sterna sandvicensis Sterna maxima
Least Bittern American Oystercatcher	Ixobrychus exilis Haematopus palliatus	Bald Eagle Sandwich Tern	Haliaeetus leucocephalus Sterna sandvicensis
Black Rail Least Bittern	Laterallus jamaicensis Ixobrychus exilis	Bald Eagle	Haliaeetus leucocephalus
Mammals			
Rafinesque's Big-Eared Bat	Corynorhinus rafinesquii	Eastern Chipmunk	Tamias striatus
Southeastern Weasel	Mustela frenata olivacea	Manatee	Trichechus manatus
Santa Rosa Beach Mouse	Peromyscus polionotus leucocephalus	Florida Black Bear	Ursus americanus floridanus
Southeastern Fox Squirrel	Sciurus niger niger		
Plants			
Pine-Woods Bluestem	Andropogon arctatus	Dwarf Witch-alder Piedmont Water-Milfoil	Fothergilla gardenii Myriophyllum laxum
Southern Three-Awned Grass	Aristida simpliciflora	Giant Orchid Narrowleaf Naiad	Pteroglossaspis ecristata Najas filifolia
Hairy Wild Indigo	Baptisia calycosa var villosa	Piedmont Water-Milfoil West Florida Cowlily	Myriophyllum laxum Nuphar lutea ssp ulvacea
Curtiss' Sandgrass	Calamovilfa curtissii	Narrowleaf Naiad Naked-Stemmed Panic Grass	Najas filifolia Panicum nudicaule
Sweet Shrub	Calycanthus floridus	West Florida Cowlily Chapman's Butterwort	Nuphar lutea ssp ulvacea Pinguicula planifolia
Baltzell's Sedge	Carex baltzellii	Primrose-Flowered Butterwort Primrose-Flowered Butterwort	Pinguicula primuliflora Pinguicula primuliflora
Sandhill sedge	Carex tenax	Little Club-Spur Orchid Little Club-Spur Orchid	Platanthera clavellata Platanthera clavellata
Godfrey's Golden Aster	Chrysopsis godfreyi	Yellow Fringeless Orchid Yellow Fringeless Orchid	Platanthera integra Platanthera integra
Cruise's Golden Aster	Chrysopsis gossypina ssp cruiseana	Large-Leaved Jointweed Large-Leaved Jointweed	Polygonella macrophylla Polygonella macrophylla
Pond Rush	Cladium mariscoides	Florida Pondweed Florida Pondweed	Potamogeton floridanus Potamogeton floridanus
Piedmont Jointgrass	Coelorachis tuberculosa	Arkansas Oak Arkansas Oak	Quercus arkansana Quercus arkansana
Spoon-Leaved Sundew	Drosera intermedia	Small-Flowered Meadowbeauty Small-Flowered Meadowbeauty	Rhexia parviflora Rhexia parviflora
Beaked Spikerush	Eleocharis rostellata	Florida Flame Azalea OrangeFlorida Flame Azalea	Rhododendron austrinum Rhododendron austrinum

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Trailing Arbutus	Epigaea repens	Hairy Peduncled Beakrush Hairy-Peduncled Beakrush	Rhynchospora crinipes Rhynchospora crinipes
Heartleaf	Hexastylis arifolia	White-Top Pitcherplant Narrow-Leaved Beakrush	Sarracenia leucophylla Rhynchospora stenophylla
Serviceberry Holly	Ilex amelanchier	Sweet Pitcherplant White-Top Pitcherplant	Sarracenia rubra Sarracenia leucophylla
Coville's Rush Florida Anise	Juncus gymnocarpus Illicium floridanum	Thorne's Buckthorn Sweet Pitcherplant	Sideroxylon thornei Sarracenia rubra
Mountain Laurel Coville's Rush	Kalmia latifolia Juncus gymnocarpus	Silky Camellia Gopherwood Buckthorn	Stewartia malacodendron Sideroxylon lycioides
Bog Button Mountain Laurel	Lachnocaulon digynum Kalmia latifolia	Pineland Hoary-Pea Thorne's Buckthorn	Tephrosia mohrii Sideroxylon thornei
Panhandle Lily Bog Button	Lilium iridollae Lachnocaulon digynum	Kral's Yellow-Eyed Grass Silky Camellia	Xyris louisianica Stewartia malacodendron
Coville's Rush Panhandle Lily	Juncus gymnocarpus Lilium iridollae	Harper's Yellow-Eyed Grass Pineland Hoary-Pea	Xyris scabrifolia Tephrosia mohrii
Hummingbird Flower Gulf Coast Lupine	Macranthera flammea Lupinus westianus	Botrychium lunarioides Chapman's Yellow-Eyed Grass	Winter Grape-fern Xyris chapmanii
Ashe's Magnolia Hummingbird Flower	Magnolia ashei Macranthera flammea	Pond's Lobelia Drummond's Yellow-Eyed Grass	Lobelia boykinii Xyris drummondii
Pyramid Magnolia Ashe's Magnolia	Magnolia pyramidata Magnolia ashei	Kral's Yellow-Eyed Grass	Xyris louisianica
Pyramid Magnolia	Magnolia pyramidata	Harper's Yellow-Eyed Grass	Xyris scabrifolia
Indian Cucumber-Root	Medeola virginiana	Botrychium lunarioides	Winter Grape-fern
Dwarf Witch-alder	Fothergilla gardenii	Pond's Lobelia	Lobelia boykinii
Giant Orchid	Pteroglossaspis ecristata		

Source: Florida Natural Areas Inventory (1997December 2008).

C.1 Endangered and Threatened Plants and Animals

The Florida Natural Areas Inventory (FNAI) maintains a list of endangered and threatened species and species of special concern that have been sighted or are known to exist in habitats similar to those found in Santa Rosa County. Table 11-2 on the following page shows the listed species that occur in Santa Rosa County.

Table 11-2
Listed Species that Occur in Santa Rosa County

SPECIES	Status		Habitat
	Federal	State	
FISH			
Gulf Sturgeon	LT	LS	
Crystal Darter		LT	
Harlequin Darter		LS	

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Table 11-2
Listed Species that Occur in Santa Rosa County

SPECIES	Status		Habitat
	Federal	State	
Saltmarsh Topminnow	SC	LS	
Blackmouth Shiner		LE	
Bluenose Shiner		LS	
REPTILES			
American Alligator	TSAT	TLS	651, 610, 641
Green Turtle	ELE	ELE	651, 710, 720, 425
Loggerhead Turtle	TLT	TLT	710, 720, 425
Eastern Indigo Snake	TLT	TLT	411, 425, 421, 610
Florida Pine Snake		SSCLS	413, 421, 425, 411
Gopher TurtleTortoise		SSCLT	310, 413, 421, 425, 610
Kemp's Ridley	ELE	ELE	
Leatherback	ELE	ELE	
Alligator Snapping Turtle		SSCLS	
AMPHIBIANS			
Reticulated Flatwoods Salamander	LT, PE	LS	
Florida Gopher Frog	———	SSCLS	411, 412, 413, 421
Pine Barrens Tree Frog		SSCLS	611
Florida Bog Frog		SSCLS	
MAMMALS			
Eastern Chipmunk		LS	
Black Bear (Florida)		TLT	411, 421, 425, 610, 611
Manatee	ELE	ELE	651
BIRDS			
American Oystercatcher		SSCLS	710, 720, 425
Black Skimmer	———	SSCLS	
Snowy Plover		LT	
Brown Pelican		SSCLS	612
Least Tern		TLT	651, 710, 720, 425
Little Blue Heron		SSCLS	641
Peregrine Falcon	E	ELE	

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Table 11-2
Listed Species that Occur in Santa Rosa County

SPECIES	Status		Habitat
	Federal	State	
Piping Plover	TLT	TLT	710, 720, 425
Snowy Egret		SSC,LS	641
Southeastern American Kestrel		TLT	710, 720, 425, 412
Osprey		LS	
Swallow-Tailed Kite	———	SSC	610, 641, 310
Tricolor Heron	———	SSC,LS	641
White Ibis		SSC,LS	
Wood Stork	ELE	ELE	651, 641
Red-Cockaded Woodpecker	TLE	ELS	
Marian's Marsh Wren	———	SSC,LS	
PLANTS			
Pine woods Bluestem		LT	
Hairy Wild Indigo		LT	
Cruise's Golden Aster		ELE	
Gulf Coast Lupine		T	710, 720, 425
Curtiss' Sandgrass		TLT	
Sweet shrub		LE	
Baltzell's Sedge		LT	
Godfrey's Goldenaster		LE	
Piedmont Jointgrass		LT	
Spoon-leaved Sundew		LT	
Beaked Spikerush		LE	
Trailing Arbutus		LE	
Dwarf Witch-alder		LE	
Heartleaf		TLT	
Serviceberry Holly		LT	
Coville's Rush		LE	
Florida Anise	———	T	
Mountain Laurel	———	TLT	
Bog Button		LT	

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Table 11-2
Listed Species that Occur in Santa Rosa County

SPECIES	Status: Federal	Status: State	Habitat
Panhandle Lily		ELE	
Pond's Lobelia		LE	
Hummingbird Flower		ELE	
Ashe's Magnolia		ELE	
Pyramid Magnolia		ELE	
Narrowleaf Naiad		LT	
Indian Cucumber-Root		E	
Chapman's Butterwort		T	
Primrose-Flowered Butterwort		ELE	
Little Club-spur Orchid		LE	
Yellow Fringeless Orchid		LE	
White-Top Pitcherplant		ELE	
Sweet Pitcherplant		TLT	
Thorne's Buckthorn		LE	
Large-Leaved Jointweed		TLT	
Florida Pondweed		LE	
Giant Orchid		LT	
Arkansas Oak		LT	
Small-flowered Meadowbeauty		LE	
Florida Flame Azalea		LE	
Hairy-peduncled Beakrush		LE	
Silky Camellia		ELE	
Pineland Hoary-pea		LT	
Kral's Yellow-Eyed Grass		E	
Harper's Yellow-Eyed Grass		TLT	

Legend E=Endangered T=Threatened SSC=Species of Special Concern

Federal Status:

LE – Endangered: Species in danger of extinction throughout all or a significant portion of its range.

LT – Threatened: species likely to become endangered within the foreseeable future throughout, all or a significant portion of its range.

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Table 11-2 Listed Species that Occur in Santa Rosa County		
SPECIES	Status Federal State	Habitat
LT, PE – Species currently listed Threatened but has been proposed for listing as Endangered. SAT – Threated as threatened due to similarity of appearance to a species which is federally listed such that enforcement personnel have difficulty in attempting to differentiate between the listed and unlisted species. State Status LE – Endangered: species, subspecies, or isolated population so few or depleted in number or so restricted in range that it is in imminent danger of extinction. LT – Threatened: species, subspecies, or isolated population facing a very high risk of extinction in the future. LS – Species of Special Concern is a species, subspecies, or isolated population which is facing a moderate risk of extinction in the future.		
Sources: Florida Natural Areas Inventory (1997December 2008), Florida Fish and Wildlife Conservation Commission, 1997May 2008.		

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~~D.~~ Surface Water Resources

The County's water resources are vital to its population and future economic success. There are two main categories of water resources, surface water and ground water resources. Examples of surface water include creeks, lakes and rivers. Surface water is found above the earth's surface and can be contaminated by rainwater runoff from homes, businesses, roads and parking lots. Fertilizer and pesticide from lawns and farms as well as fluids that leak from autos can all get washed into surface water supplies from rainwater runoff. Santa Rosa County's surface water resources are described below in general.

~~*Map 11-26 XXX (Appendix A) shows the watersheds for the Pensacola Bay System. Add Description.*~~

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~~D.16.3.5.1~~ *Escambia River*

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Originating in Alabama as the Conecuh River, the Escambia River travels south approximately 240 miles before discharging into Escambia Bay. The river flows approximately 54 miles south from the state line to Escambia Bay. The river basin drains a total of 4,223 square miles, 425 of which are within Florida. The Escambia River is the fourth largest in the state in terms of discharge~~, with an average annual discharge of 6,300 cubic feet per second (cfs) (Fernald and Patton, 1984). Seasonal fluctuations are large, with floods commonly occurring in winter and early spring and low flows generally occurring from late spring through autumn (Bass, 1990). Flows originate primarily from rainfall, with some groundwater contribution via scattered springs and seepage from surficial sands (FREAC, 1989). Measurements at Century, Florida, near the Alabama state line, indicate a seven-day, ten-year low flow to be approximately 800 cubic feet per second (cfs) and mean flow of over 6,500 cfs (Olinger et al., 1975). The U.S. Army Corps of Engineers, monitoring at Century, FL, estimated annual runoff values around 21.95 inches (U.S. Army Corps of Engineers, 1980). Pine Barren Creek is the river's largest tributary within Florida, draining approximately 98 square miles. Tidal influence causes river level fluctuations at least ten miles upriver. During periods of low flow, a salt wedge extends upriver from Escambia Bay for about seven miles at high tide (Musgrove et al., 1965). Total dissolved solids, resulting from limestone outcroppings in Alabama, reach above 100 parts per million (ppm) at Century (Musgrove et al., 1965), but tributaries in Florida tend to dilute this influence downstream.~~. The Northwest Florida Water Management District currently owns The District currently owns 35,413 acres in fee and nearly 19 acres in less than fee along the Escambia River. The Escambia River Water Management Area contains a high diversity of plants and animals. Land coverage types include large acreages of hardwood forests, pine flatwoods, and estuary marshlands.

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~~***The Escambia River is described as a classic alluvial river (Fernald and Patton, 1984). As such, it carries a heavy sediment load and has substantial variation in flows and a diversity of associated aquatic and wetland habitat types. The river is slightly acidic (mean pH 6.4) (Bass, 1990). The upper river (within Florida) is sand-bottomed, with sand bars and beaches forming along the inside arcs of river bends. According to Bass (1990), in-stream vegetation tends to be lacking, with habitat primarily provided by snags, exposed tree roots, and undercut banks. Bottomland hardwood forest and oxbow lakes border the main river, although pine forest also occupies much of the riparian zone. The lower river is influenced by tides, and is bordered by emergent marshes as well as patches of swamp.***~~

~~***The Escambia is among the more impacted rivers in the region. It receives industrial and domestic waste discharges, as well as substantial nonpoint source pollution. Additionally, the lower river has been dredged for navigation purposes, and two dams are upstream in Alabama (Bass, 1990).***~~

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~~***Bass (1990), however, describes fish populations and water quality in the river in general as being in a state of recovery. Characteristic species of fish reported by Bass (1990), include warmouth (Lepomis gulosus), largemouth bass (Micropterus salmoides), and channel catfish (Ichthyomyzon punctatus).***~~

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~~***The river corridor contains a rich diversity of biological species and biological communities. The Escambia River is a concentration area for songbirds, warblers, shorebirds, waterfowl, diving ducks, Peregrine Falcons, and raptors. There have been several imperiled biological communities listed on the Escambia River: seepage slope, slope forest, and alluvial stream. Ravine and steephead communities occur along the Escambia River as well (Ibid., 139).***~~

~~***According to FNAI, the endangered Pyramid Magnolia occurs in the Escambia River corridor. Other endangered botanical species that probably occur within the larger Escambia River basin are the Panhandle Lily, Orange Azalea, White-top Pitcherplant, and Trailing Arbutus.***~~

~~***The Escambia River contains several species of rare fishes. On the State list are the threatened Crystal Darter and four species of special concern, the Atlantic Sturgeon, Harlequin Darter, Saltmarsh Topminnow, and Bluenose Shiner; other rare fishes include the Goldstripe Darter, Cypress Darter, Speckled Chub, Cypress Minnow, River Redhorse, and Saddleback Darter, all of which are classified as threatened by the Florida Committee on Rare and Endangered Plants and Animals (FCREPA). The exotic Grass Carp has also been caught from the Escambia River (Florida Rivers Assessment, 139).***~~

~~***The Alligator Snapping Turtle is the only State-designated wildlife species in the FNAI database within the Escambia River corridor. Other designated wildlife species that are undoubtedly in the Escambia River drainage area include the threatened Florida Black Bear, Southeastern American Kestrel, and Bald Eagle and species of special concern such as the Gopher Tortoise, Osprey, and the expected herons and egrets. The Escambia River is also one of the few rivers in the State that has records of the Smokey Shadowfly, a threatened species according to the Florida Committee on Rare and Endangered Plants and Animals (FCREPA). The American Redstart and the Louisiana Waterthrush, both are classified as rare by the Florida Committee on Rare and Endangered Plants and Animals (FCREPA), and are found in the northern portions of the Escambia River as well. The Eastern Chipmunk, a species of special concern, can be found on the western banks of the Escambia River. Several exotic botanical species grow along the River, including Parrot Feather, Torpedograss, Eurasian Watermilfoil, and Alligator-Weed (Florida Rivers Assessment, 140).***~~

~~*D.26.3.5.2*~~ *Blackwater River*

Originating in Bradely, Alabama, the Blackwater River travels south approximately 62 miles prior to discharging into Escambia Bay. The river drains approximately 860 square miles, approximately 700 of which are within Florida, and has an average annual discharge of approximately 342 cfs (Fernald and Patton, 1984). Average depths are between two and 15 feet, and widths tend to vary between 110-300 feet (Bass and Hitt, 1977). The major source of flow is groundwater discharge, with a smaller contribution from surface runoff (Livingston et al., 1988).

~~Water samples taken near Baker indicate generally acidic conditions, periodically falling below 6.0 pH (U.S. Army Corps of Engineers, 1980). Lower portions of the river have a tidal range of approximately two feet, and saltwater intrusion has been identified six miles upstream. Principal tributaries of the river include Big Juniper Creek, Big Coldwater Creek, and Pond Creek..~~

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The Blackwater River is designated an Outstanding Florida Water (OFW), and is among the most popular waterbodies in the state for canoeing and other recreational activities. The aptly named Blackwater River and its tributaries drain acidic flatwoods and other wetlands, as well as being influenced by discharge from the Sand and Gravel Aquifer (Hand et al., 1996). The river tends to exhibit a reddish color, due primarily to the presence of tannic and organic acids (FREAC, 1989). The upper Blackwater River and its tributaries Big Juniper Creek, Sweetwater Creek, and Big Coldwater Creek are swift, relatively shallow, and sand-bottomed (Bass and Hitt, 1977). Aquatic vegetation is sparse, some habitat cover is provided by snags, fallen trees, and undercuts. In the 1970s, only the upper reaches of this system were assessed as having adequate cover for fish habitat (Bass and Hitt, 1977). The lower Blackwater River is tidally influenced with moderate currents. Substrates are more fine and organic, and emergent and submergent species of vegetation are more common. Pond Creek is similar to the lower Blackwater River, with lower reaches tidally influenced. Currents are moderate, substrates range from sand to mud, and emergent and submergent species of vegetation are common. Bass and Hitt (1977) further describe a series of lake-like freshwater and brackish basins along the lower river. Aquatic vegetation is abundant in these basins, substrates tend to be rich and organic with sand along some shorelines, and currents are nonexistent except when associated with tidal fluctuation.

The lower Blackwater River system receives discharges from domestic wastewater treatment facilities, and portions of the system are subject to impacts from nonpoint source pollution. ~~Water quality in general has been characterized as excellent; however, and much of the river basin is protected by conservation lands.~~

~~Characteristic fish species reported by Bass and Hitt (1977) include spotted bass (*Micropterus punctulatus*), sailfin shiner (*Pteronotuopis hypsolopterus*), chain pickerel (*Esox niger*), and largemouth bass (*Micropterus salmoides*). The Blackwater River system supports the endangered blackmouth shiner (*Notropis melanostomus*). Among the sensitive species living in the watershed are the red cockaded woodpecker (*Picoides borealis*), Florida pine snake (*Pituophis melanoloucus mugitus*), eastern indigo snake (*Drymarchon corais couperi*), osprey (*Pandion haliactus*), Florida black bear (*Ursus americanus floridanus*), and the white-topped pitcher plant (*Sarracenia leucophylla*) (Cox et al., 1994).~~

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~~D.3.6.3.5.3~~ *Yellow River*

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The Yellow River originates in Covington County, Alabama and travels 92 miles to Blackwater Bay in Florida. The river travels through the Western Highlands in parts of Alabama and Okaloosa County, Florida, creating bluffs reaching 40 feet in some areas (Livingston et al., 1988). The river drains generally from the east/northeast and has a drainage basin of 1,365 square miles, of which about 860 are within Florida. The river floodplain is generally about two miles wide and has an extensive floodplain forest. Fluctuations due to tidal effects are noticeable nearly 19 miles upstream.

The Yellow River is described as a sand bottom river and is characterized by shallow clear-tan waters. It has an average annual discharge of approximately 1,500 cfs 40 miles above the mouth (Hand et al., 1996). The principal tributary of the Yellow River is the Shoal River, which originates in northern Walton County and discharges an annual average of 1,104 cfs into the Yellow River south of Crestview (Fernald and Patton, 1984). Titi and Turkey creeks are tributaries of the Shoal River. The lower portion of the Yellow River, as well as portions of Blackwater and East Bays, are managed as the Yellow River Marsh Aquatic Preserve. ~~The Shoal River (Okaloosa County) and waters within the aquatic preserve are designated as Outstanding Florida Waters (OFWs). Both the Yellow and Shoal rivers are prone to flooding during the winter and spring months, and experience high discharge rates between November and June (U.S. Army~~

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~~Like other systems, the Yellow River system is subject to impacts from a variety of nonpoint sources of~~

~~Common fish species supported by the Yellow River system are similar to those described above for the Escambia and Blackwater Rivers. Some of the species identified by Eglin Air Force Base (1993) included speckled madtom (*Noturus leptacanthus*), redbreast sunfish (*Lepomis auritus*), and chain pickerel (*Esox nigor*).~~

~~The Yellow River's extensive wetlands provide a habitat for several designated plant and animal species. Because of its northern location and origins, the Yellow River also supports several species of wildlife normally found in northern areas as well. There is more aquatic vegetation in the Yellow River than in many rivers to the west (Florida Rivers Assessment, 433). The FNAI database contains several occurrences of seepage slopes along the River. This naturally rare biological community is the home for two designated frog species in Florida.~~

~~The Yellow River corridor encompasses the range of several endangered botanical species but the FNAI database has only one of these species documented, the Sweet Pitcher-plant. Other state-designated endangered species that may occur along the Yellow River include the Panhandle Lily, Orange Azalea, Ashe's Magnolia, and the White-top Pitcher Plant (Ibid., 433).~~

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~~The Yellow River is the home of four state-designated fish species. The endangered Blackmouth Shiner has been documented from the Yellow River. The Saltmarsh Topminnow, Atlantic Sturgeon, and the Bluenose Shiner are three documented species that are species of special concern. The Blackmouth Shiner is known at a few localities in Florida. Other species that occur in the Yellow River drainage include the Speckled Chub and the Goldstripe Darter, both threatened species according to The Florida Committee on Rare and Endangered Plants and Animals (FCREPA). The only exotic fish species documented from the Yellow River is the Grass Carp (Ibid., 433).~~

~~***Besides the fishes, there are several species of special concern recorded from the Yellow River and are in the FNAI database. These species include the Pine Barrens Tree Frog, Florida Bog Frog, Alligator Snapping Turtle, Gopher Tortoise, and the Eastern Chipmunk. The Yellow River is unusual biologically in having several species of invertebrates that are virtually endemic to the Yellow River area. There are three species of mayflies along the River listed by the Fish and Wildlife Services. Another dragonfly species is known in Florida only from the Yellow River drainage and is listed as threatened by The Florida Committee on Rare and Endangered Plants and Animals (FCREPA) (Florida Rivers Assessment, 434).***~~

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~~D.~~4~~6~~.3.5.4 ~~B~~Big Coldwater Creek and East Fork River

This river originates in Santa Rosa County and is the most western stream in the Blackwater River State Forest. The upper section of the Big Coldwater and East Fork runs through the dense Calloway Swamp. The River is characterized by a very narrow width, and swift, shallow water. The Big Coldwater is a major tributary of the Blackwater River. The drainage area of this river is approximately 237 square miles near Milton (Florida Rivers Assessment, 83).

~~The Big Coldwater and East Fork have been specially designated as the Coldwater Creek Canoe Trail by the Department of Environmental Protection. Florida's natural beauty and unique environment beckon to residents and visitors alike. Recognizing the incredible appeal of Florida to outdoor enthusiasts of all kinds, the Florida Recreational Trails Act of 1979 authorized the establishment of a network of recreation, scenic,~~

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~~and historic trails. The Department of Environmental Protection has officially designated 36 canoe trails~~ Blackwater River State Forest is a recreation and conservation land that allows multiple uses. The forest, managed by the Florida Department of Agriculture and Consumer Services and the Division of Forestry, also serves as the Blackwater Wildlife Management Area. The Florida Game and Fresh Water Fish Commission manages the wildlife management area. The wildlife management area harbors deer, turkey, and small game for hunting (Florida Rivers Assessment, 83).

The Blackwater River State Forest is on part of the Big Coldwater Creek and East Fork River. The Blackwater River State Forest is a recreation and conservation land that allows multiple uses. The forest, managed by the Florida Department of Agriculture and Consumer Services and the Division of Forestry, also serves as the Blackwater Wildlife Management Area. The Florida Game and Fresh Water Fish Commission manages the wildlife management area. The wildlife management area harbors deer, turkey, and small game for hunting (Florida Rivers Assessment, 83).

~~*D.5*~~*6.3.5.5 Escambia Bay*

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Escambia Bay is situated between the City of Pensacola and unincorporated portions of Escambia County to the west, the Garcon Point peninsula to the east, and the Escambia River delta to the northwest. The primary source of water in the bay is the Escambia River. Other sources in upper Escambia Bay include the Pace Mill Creek and Mulatto Bayou drainage basins, among others. Sources of water in lower Escambia Bay include the river via upper bay and the Indian Bayou, Trout Bayou, and Bayou Texar (City of Pensacola) basins.

Tidal flushing in Escambia Bay is considered poor, and sediments are highly organic. Circulation is most strongly influenced by inflow from the Escambia River, as well as from winds, and tides. There is a net southward flow of river water along the western shore, with more saline water intruding along the eastern shore. This tends to produce a generally counterclockwise circulation pattern (Hudson and Wiggins, 1996). High tides, low river discharge, and strong surface winds (especially southeast and southwest winds) tend to decrease stratification, while the reverse of these conditions increases it. Railroad and highway bridges may inhibit flushing and exchange between the upper and lower bay, and surface wind effects may also influence circulation in upper portions of the bay.

Escambia Bay is among the most anthropogenically stressed components of the Pensacola Bay system. It has historically received substantial industrial and domestic wastewater discharges, and is still affected by surface water discharges and reuse sources in the vicinity of the bay, as well as from the Escambia River basin. The bay also receives non-point source pollution from the City of Pensacola, unincorporated areas of Escambia County, and the river basin. ~~Bayous, such as Texar and Mulatto, are also impacted by non-point source pollution, and Bayou Texar may also be threatened by contaminated plumes from two U.S. EPA designated Superfund sites (Martin 1997).~~

~~*D.6*~~*6.3.5.6 Blackwater and East Bays*

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Blackwater Bay is at the mouth of the Blackwater River and borders the Garcon Point peninsula to the west. This bay receives discharge from the Blackwater River. East Bay is immediately downstream of Blackwater Bay and receives inflow from Blackwater Bay, the Yellow River, and the East Bay River, which flows from the east. East Bay is bounded to the south by the Gulf Breeze peninsula.

According to Hudson and Wiggins (1996), circulation in Blackwater and East bays tends to be counterclockwise. Generally, fresh water from the Blackwater and Yellow Rivers flows south along the western shore of East Bay, and more saline waters flow northward along the eastern shore. The importance of winds on circulation and mixing are enhanced during periods of low flows. Vertical

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stratification of these waterbodies has been noted, as well as mixing of Blackwater, Escambia, and Pensacola bay waters with the waters in East Bay. These bays are shallow, with relatively organic sediments—although composition at specific sites may vary from sand to mud (Collard, 1991a; Bass and Hitt, 1977). Aquatic vegetation varies, with most associated with tidal marshes at mouths of the Blackwater and Yellow Rivers.

Although Blackwater and East Bays ~~have been~~were described at one time as the most unaffected estuarine portions of the system from anthropogenic degradation, they ~~have~~ were also ~~been~~ described as the most vulnerable to future degradation (Collard, 1991a). This, in part, is because these bays are lower in energy and tidal flushing than other estuarine portions of the system. Nonpoint source pollution ~~may be~~has increas~~inged~~ from residential and commercial development in Santa Rosa County, and the system also receives discharges from several point sources.

~~D.7~~6.3.5.7 Santa Rosa Sound

Santa Rosa Sound, a lagoon between the mainland and Santa Rosa Island, connects Pensacola Bay in the west with Choctawhatchee Bay in the east. The Sound extends approximately 57.9 km along an east-west orientation, varying in width between 0.32 and 3.5km (FDEP, 1993). Most waters within the Sound are designated as Class II, and waters within the National Seashore are designated Outstanding Florida Waters. The Intracoastal Waterway (ICW) transects the Sound and supports moderate commercial barge traffic.

According to the Florida Marine Research Institute (FDEP, 1993), the Navarre Bridge Causeway divides the Sound into nearly equal sized eastern and western regions and contributes to a bi-directional tidal flow. Salinity and depth are fairly uniform throughout the Sound, with mean annual values of 24 ppt and 2.7 m respectively. Santa Rosa Sound receives little fresh water inflow (Hand et al., 1996).

Santa Rosa Sound is notable as being the site of the most diverse and stable seagrass beds within the Pensacola Bay system. Anthropogenic stresses on the lagoon's environment include non-point source pollution and habitat loss resulting from increasing development on Santa Rosa Island and along the U.S. Highway 98 corridor. The Navarre Beach and Pensacola Beach waste water treatment plants discharge to the Sound (Hand et al., 1996). The Sound also receives runoff from several golf courses, including effluent from spray irrigation with treated municipal wastewater.

~~D.8~~6.3.5.~~8~~1 Outstanding Florida Waters

~~The Department of Environmental Protection has designated waters inside the Yellow River Marsh Aquatic Preserve, the Blackwater River, the Blackwater River State Park and Santa Rosa Sound through the Gulf Islands National Seashore as Outstanding Florida Waters (OFWs).~~ Section 403.061(27), Florida Statutes, grants the Department of Environmental Protection (DEP) the power to establish rules that provide for a special category of waterbodies within the state, to be referred to as "Outstanding Florida Waters," which shall be worthy of special protection because of their natural attributes.

The Department of Environmental Protection has designated waters inside the Yellow River Marsh Aquatic Preserve, the Blackwater River, the Blackwater River State Park and Santa Rosa Sound through the Gulf Islands National Seashore as Outstanding Florida Waters (OFWs). Projects regulated by the Department or a Water Management District (WMD) that are proposed within an OFW must not lower existing ambient water quality, which is defined for purposes of an OFW designation as the water quality at the time of OFW

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designation or the year before applying for a permit, whichever water quality is better. In general, DEP cannot issue permits for **direct** discharges to OFWs that would lower ambient (existing) water quality. In most cases, this deters new wastewater discharges directly into an OFW, and requires increased treatment for stormwater discharging directly into an OFW. DEP also may not issue permits for **indirect** discharges that would significantly degrade a nearby waterbody designated as an OFW.

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In addition, activities or discharges within an OFW, or which significantly degrade an OFW, must meet a more stringent public interest test. The activity or discharge must be "clearly in the public interest." For example, activities requiring an Environmental Resource Permit (ERP), such as dredging or filling within a wetland or other surface water or construction/operation of a stormwater system, must be clearly in the public interest instead of not contrary to the public interest. ~~According to Florida Statute 403.061(28) and Florida Administrative Code 17-302.700, which establishes legislative authority and criteria for determination of OFWs, OFWs are located inside national and state parks, wildlife refuges, and aquatic preserves; and, are also located in areas purchased under the Environmentally Endangered Land Bond Program, CARL, LATF and SOC programs. Florida wild and scenic rivers, waters within national seashores, marine sanctuaries and research reserves are sometimes designated as OFWs. The OFW classified waters have exceptional recreational and ecological significance and enhance the environment, society, and the economy. Map 11-3 (Appendix AXXX) shows the location of Outstanding Florida Waters in Santa Rosa County.~~

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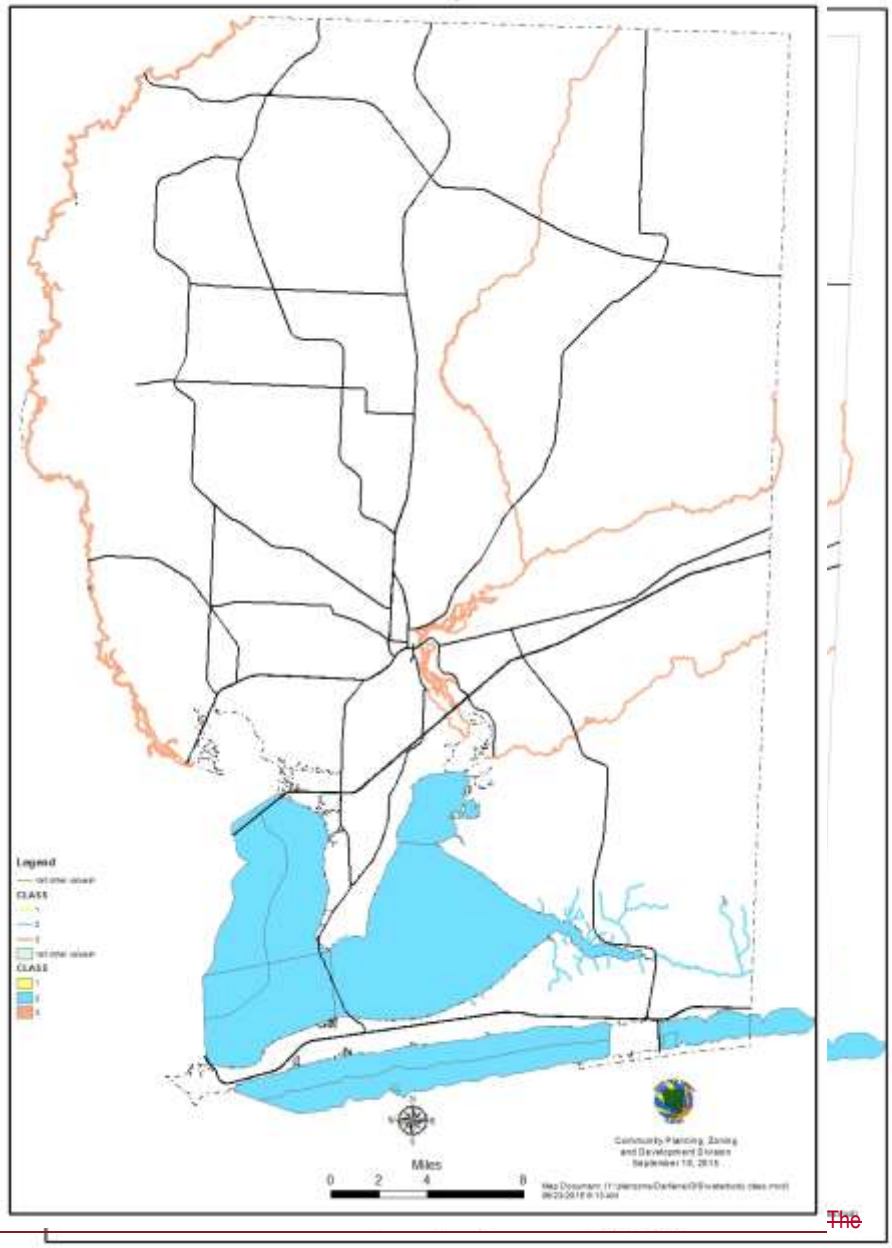
Map 6-6 Water Body Classification
Santa Rosa County, Florida



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~~primary water quality standard used in the regulation of OFWs is the actual ambient water quality of each OFW, rather than the general numerical limits of the water quality classification system. In OFWs, the definitions of water quality and water pollution are site specific, allowing for OFWs to receive greater protection against pollution. Santa Rosa County also protects these waters from pollution by requiring that development of land adjacent to these waters and any other sanctuaries, preserves and wildlife management districts be designed to a scale and intensity consistent with adjacent land uses.~~

~~**INSERT SURFACE WATER MAP with CLASS and OWFs**~~

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~~D.~~6.3.5.~~9~~ 2 Surface Water Quality

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Nonpoint Source Pollution

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Nonpoint source (NPS) pollution consists of pollution that is transported from a variety of sources to a receiving waterbody in a diffuse or dispersed manner. It is generally considered to include most sources of pollution that do not have a point outfall to a receiving waterbody (such as a discharge pipe). This type of pollution contributes a variety of pollutants and impacts the quality of the receiving waterbody in a number of ways. Frequently, nonpoint source pollution results from the interaction between land use practices and surface water hydrology within a watershed. Nonpoint source pollution can affect receiving waters in a number of ways. Stormwater runoff increases turbidity, which, in turn, decreases the amount of sunlight available for submerged vegetation. Other forms of aquatic life are also harmed by increased turbidity and sedimentation. Nonpoint sources of pollution, especially fertilizers and organic wastes, contribute nutrients and other oxygen demanding substances, which lower oxygen levels in receiving waters. Bacteria and viruses from septic tanks, boats, marinas, and urban runoff can contaminate shellfish resources and other organisms, inducing stress and disease.

There are a number of general classifications of nonpoint source pollution, which are typically characterized by the land use practices that result in the pollutant loading. These include urban stormwater runoff, agricultural and silvicultural nonpoint pollution, dredging and filling, septic tank leachate, contaminated groundwater seepage and associated overland flows, marinas, and various unpermitted sources of pollution. Each of these types of nonpoint pollution impacts the Pensacola Bay system.

Stormwater runoff from urbanized areas, including roads, parking lots, construction sites, yards, etc.,has a significant impact on the Pensacola Bay system. The traditional emphasis of urban stormwater management has been to deal only with stormwater quantity-related issues at the local level. A consequence of this is that stormwater runoff is frequently routed to a receiving water body with very little effort to improve its quality prior to discharge. Reducing the impacts of urban stormwater runoff would require increasing the amount that is allowed to infiltrate back into the ground water and improving the quality of the discharge. Components of this would include such measures as onsite and regional stormwater treatment, buffer zones, limiting impervious areas, grassed waterways, controlling fertilizer use, and construction site best management practices. Such measures are generally implemented by local governments through the adoption of comprehensive stormwater plans, the implementation of such plans, and the use of stormwater utilities or other means of dedicated funding.

Agricultural runoff is a significant source of sediment, nutrients, and pesticides. Intensive forestry operations can cause severe sedimentation problems and can disrupt the pH of receiving waters. Also, removing trees from close to the edge of a waterbody eliminates the natural shading of the banks and may cause the average water temperature to increase. For both silviculture and agriculture, attempts at

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pollution abatement have historically been centered on voluntary programs promoting the use of best management practices (BMPs). Recently initiated activities of the Natural Resource Conservation Service (NRCS) and Farm Service Agency (FSA), associated with the implementation of the Food Security Act and 1996 Farm Bill, have the potential to reduce nonpoint loadings from agricultural land uses, depending on the scale of their implementation. Dredge and fill activity creates and exacerbates NPS pollution through a variety of means. Fill dirt and excavated soil frequently runs off into surrounding waterbodies during excavation, filling, and related construction activities.

Wetland conversion creates additional demand for new development, with resulting runoff and non-point source pollution. Losses of wetlands reduces the capacity of the system to store runoff and flood waters and eliminates the filtering and nutrient cycling functions of the lost wetlands. Displacement of wetlands also causes hydrologic disruption within the system. Dredging causes turbidity and deposition within the aquatic system and releases nutrients and contaminants into the water column.

Another source of nonpoint pollution, and one that is often a constituent of urban runoff is septic tank leachate. Installation of septic tanks in soils with limited capacity for this use or inadequate maintenance can result in the contamination of surface waters by leachate. This is of particular importance near bayous and bays due to the susceptibility of shellfish to contamination from bacterial and viral pathogens, as well as public health concerns related to body-contact water sports. Soils bordering bays, rivers, bayous and other flood-prone areas often have severe limitations for use as septic tank absorption fields and sewage lagoon areas. As development continues in these areas, problems with surface water contamination will increase if adequate regulations and controls are not in place.

Holding ponds also affect surface waters via overflows during rain (or excessive inflow) events. Some facilities may have a potential to contaminate waters with hazardous wastes. Some hazardous waste sites have been identified and are regulated by DEP through the Resource Conservation and Recovery Act (RCRA) and underground storage tank programs. The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) is administered by the U.S. EPA.

Marinas contribute NPS pollution both during construction and operation and are also of concern due to the susceptibility of shellfish and other marine life to contamination by the toxins and pathogens associated with marina-related discharges. Marina construction may result in turbidity and benthic deposition from construction activities and dredging. Chronic impacts which result from marina operations may include the following: 1) oils and greases and other hydrocarbons from fuel boat exhaust, fuel spills, and illegal bilge pumpouts; 2) solid waste from trash, fish carcasses, and solvents associated with boat maintenance (deck washing, hull cleaning, etc.); 3) heavy metal contamination from lead, copper, and other pollutants found in hull paints, anti-fouling chemicals, stormwater runoff, and engine exhausts; and 4) contamination from boat head facilities, which result in increased coliform bacteria, reduced dissolved oxygen, increased nutrients and biological oxygen demand, and general water degradation. Marinas are routinely permitted with provisions to ensure that facilities are maintained—vessels are not allowed to discharge; fish carcasses, food waste, litter, fuel, oil, grease, and other pollutants are not permitted to be disposed of into the water; waste containers are to be located along the docks; fish cleaning stations and restrooms are located on upland property; fuel dispensing facilities are to be equipped with automatic shut-off valves; and emergency cleanup equipment are supposed to be maintained on-site. These permit conditions; however, have failed to eliminate NPS pollution from marinas.

An additional source of NPS pollution is atmospheric deposition. Nitrogen originates from a variety of sources within an airshed that is considerably larger than the watershed. Computer modeling suggests that utility and mobile (such as automobile exhaust) sources are approximately equally responsible for nitrate

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deposition in the eastern United States (Appleton, 1995). While the Pensacola Bay region may have fewer industrial air pollution sources than are in the vicinity of Tampa Bay, it does have a considerable, and increasing, number of automobiles and may be affected by a number of industrial and utility sources throughout its airshed.

Point Source Pollution

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The Pensacola Bay system has a long history of cultural impacts from a variety of uses. Point source discharges from domestic and industrial wastewater facilities have been particularly significant in the Pensacola Bay system. Point sources of pollution are those with a distinct, identifiable point of discharge (e.g., a pipe) to a waterbody. Two general categories of point sources are recognized: sewage treatment (domestic waste) and industrial facilities. In Florida, the DEP has statutory responsibility for regulating point sources of discharge.

The impacts of point source pollution on the Pensacola Bay system have been generally known for some time. The Escambia Bay Recovery Program, initiated by the EPA in the early 1970s, concluded that industrial and domestic point source discharges significantly contributed to poor conditions within the system. Subsequently, large point source discharges to the system were improved to meet more stringent permitting criteria. The Pensacola Bay system appears to have improved since that time, as demonstrated by fewer fish kills and noticeable improvements in water quality. The current condition of the system, however, remains far from optimal.

~~6.3.5.9.1~~ Surface Water Body Classification in Santa Rosa County

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The Clean Water Act requires that the surface waters of each state be classified according to designated uses. Florida has six classes with associated designated uses, which are arranged in order of degree of protection required:

Class I - Potable Water Supplies

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Fourteen general areas throughout the state including: impoundments and associated tributaries, certain lakes, rivers, or portions of rivers, used as a source of potable water.

Class II - Shellfish Propagation or Harvesting

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Generally coastal waters where shellfish harvesting occurs.

Class III - Fish Consumption, Recreation, Propagation and Maintenance of a Healthy, Well-Balanced Population of Fish and Wildlife

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The surface waters of the state are Class III unless described in rule 62-302.400, F.A.C.

Class III-Limited – Fish Consumption; Recreation or Limited Recreation; and/or Propagation and Maintenance of a Limited Population of Fish and Wildlife

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This classification is restricted to waters with human-induced physical or habitat conditions that, because of those conditions, have limited aquatic life support and habitat that prevent attainment of Class III uses.

Class IV - Agricultural Water Supplies

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Generally located in agriculture areas around Lake Okeechobee.

Class V - Navigation, Utility and Industrial Use

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Currently, there are not any designated Class V bodies of water in Florida. The Fenholloway River was reclassified as Class III in 1998

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Most of the surface waters in Florida fall into Class III by default, however there are several Class II water bodies in Santa Rosa County as shown on **Map 6-6**. ~~Surface water bodies are classified by the Florida Department of Environmental Protection (FDEP) based upon the intended uses of these bodies.~~ Escambia Bay, East Bay, Blackwater Bay, and Santa Rosa Sound are classified as Class II waters. ~~Class II waters are suitable for shellfish harvesting.~~ The Escambia River, the Yellow River, the Blackwater River, Big Coldwater Creek and East Fork are classified as Class III.

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~~waters suitable for recreation and fish and wildlife maintenance and propagation.~~

Section 305(b) of the Clean Water Act (CWA) requires ~~s~~States and other jurisdictions to submit biennial water quality reports to the EPA. These reports, referred to as 305(b) reports, describe surface water and ground water quality and trends, the extent to which waters are attaining their designated uses (such as drinking water, recreation, and shellfish harvesting), and major impacts to surface water and ground water.

Total Maximum Daily Loads (TMDLs) are developed for waterbodies that are not meeting their designated use for certain water quality parameter(s), such as fecal coliforms. The TMDL is designed to restore the waterbody to fully meet its designated use once the TMDL is implemented (usually through the Basin Management Action Plan (BMAP)). **Map 6-7** depicts the basins with currently adopted TMDLs for Santa Rosa County as well as lands managed for conservation purposes. The full pending TMDL map can be found within the Infrastructure Element supporting documentation (**Map 4-5**).

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Under Section 303(d) of the CWA, states are also required to identify waters that are not attaining their designated uses, submit to the EPA a list of these impaired waters (referred to as the 303[d] list), and develop Total Maximum Daily Loads (TMDL) for them. A TMDL represents the maximum amount of a given pollutant that a waterbody can assimilate and still meet its designated uses. The following describes the TMDL process and Santa Rosa County currently does not have any waterbodies that have progressed to the Phase 4 or BMAP level. ~~The DEP undertakes water quality assessments of water bodies in response to Section 305 (b) of the Federal Clean Water Act. There are eight DEP water quality monitoring sites within Santa Rosa County monitored on a weekly basis along with fourteen water quality monitoring sites monitored quarterly by the Bream Fisherman Association.~~

~~While some areas of the system remain relatively pristine (perhaps portions of the Blackwater and Yellow river systems), others (Escambia Bay) exhibit consistently degraded water quality as a result of nonpoint and point source discharges. Other waterbodies, such as East Bay and Santa Rosa Sound appear vulnerable to increased degradation due to increasing development and non-point source pollution.~~

~~**D.9(a) Riverine Component**~~

~~***Escambia River***~~

~~The Escambia River is among the more impacted waterbodies in the region. It receives industrial and domestic waste discharges, as well as substantial nonpoint source pollution. Additionally, the lower river has been dredged for navigation purposes, and two dams are upstream in Alabama (Bass, 1990). According to Bass (1990), the Escambia River is slightly acidic (mean annual pH 6.4), tends to maintain adequate dissolved oxygen levels (annual mean 8.1 mg/l; annual range of 5.3–10.4 mg/l), and tends to have relatively low levels of dissolved solids and nutrients. Annual water~~

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temperatures were reported as ranging from eight to 29 degrees Celsius. Bass (1990) notes the historic impacts on this river system of industrial and domestic wastewater discharges, but describes the past two decades as a period of recovery for both water quality and fish populations.

According to Hand et al. (1996), water quality in the Escambia River basin as a whole is generally good; however, most tributaries appear to be threatened, and a couple were identified as moderately impaired. The Canoe Creek and Pine Barren Creek basins were described as suffering from agricultural and dirt road runoff, and Sandy Hollow Creek disappeared due to sedimentation. Sedimentation, turbidity, and pesticides are identified as potentially contributing to declining fisheries. Ferry Pass Bayou and Governors Bayou are moderately affected by the introduction of nonpoint runoff (Livingston et al., 1988). Fly ash disposal, generated during power production, has been linked to declining water quality levels in the Governors Bayou portion of the basin. The Escambia River is also susceptible to stormwater runoff from four major highways (I-10, U.S. 90, C.R.184, and S.R. 4) (FREAC, 1989).

Yellow River

Hand et al. (1996) characterizes the Yellow River system as having generally "excellent" water quality. Like other systems, the Yellow River is impacted by a variety of nonpoint sources of pollution, as well as potentially by drainage from domestic and industrial wastewater reuse facilities. Trammel Creek, which receives runoff from the City of Crestview (Okaloosa County) and, until recently, received a waste water treatment plant discharge, was assessed as having nutrient and turbidity problems. Crestview recently removed its discharge from the creek and now disposes of it via an upland sprayfield. Other tributaries described as impacted by non-point source pollution include Pond Creek, the Shoal River in the vicinity of Crestview, Horsehead Creek, Juniper Creek, and Hurricane Creek.

Blackwater River

Water quality in the Blackwater River basin was assessed by Hand et al. (1996) as "excellent." The lower Blackwater River system receives discharges from domestic wastewater treatment facilities, and portions of the system are impacted by nonpoint source pollution. High concentrations of nutrients, chlorophyll, BOD in Clear Creek have been attributed to discharge from the Whiting Field wastewater treatment plant. Water quality problems in the lower river and Blackwater Bay have been also associated with effluent from the Milton Wastewater Treatment Plant (FREAC, 1989). Much of the river basin is protected by conservation lands.

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Big Coldwater Creek and East Fork

The water quality of Big Coldwater Creek and East Fork is good. The Big Coldwater Creek and East Fork, like most streams in northwest Florida, receive large and uniform discharges of ground water from the sand and gravel aquifer that moderate the annual variation in stream flow (Florida Rivers Assessment, 83).

D.9(b) Estuarine Component

Escambia Bay

Escambia Bay is generally recognized as having the most significant water quality limitations. This is due to a number of factors, including: contaminant loading by interstate flow of the Escambia-Conecuh River System; sewage treatment plant (STP) inputs; industrial discharges within and outside the Florida portion of the Escambia River watershed; and basin-wide nonpoint inputs. The interstate nature of the problem of water quality degradation in Escambia River and Bay was typified by a series of conferences that were held in 1962, 1970, 1971 and 1972 (U.S. EPA, 1972). It was recognized at that time that the system was suffering from excessive organic and nutrient loadings, fish kills and other symptoms of ecological degradation. Hopkins (1969) examined dissolved oxygen (DO), nitrate-nitrogen, and thermal effluents from electrical power generation and industrial discharges. He also investigated the nature of the deeper estuarine waters. He noted low DO levels in the water and indicated that the assimilative capacity in upper Escambia Bay had been greatly exceeded and went on to recommend that nutrient sources entering the bay be discontinued. Hopkins (1973) studied the valuable marine resources of Escambia Bay adjacent to Escambia and Santa Rosa Counties and made recommendations concerning their conservation.

The U.S. Department of the Interior (1970) conducted an extensive examination of the effects of pollution on water quality in the Escambia River and Bay. This study, a result of a request from the Governor of Florida, said that the upper section of Escambia Bay was in a state of accelerated eutrophication based on unstable DO variations, high carbon, nitrogen, and phosphorus concentrations, and oxygen-demanding sludge deposits. It also noted that the piles of the L & N railroad bridge inhibited flushing and exchange between the upper and lower bay. The presence of sludge deposits in the bay south of the railroad bridge also degraded water quality. Also documented in the report was the industrial discharge of acrylonitrile (vinyl cyanide), and the relationship of this material to fish kills was questioned. At the time of the study, the major dischargers of carbonaceous waste were Monsanto, American Cyanamid and Container Corporation of America. Escambia Chemical (now Air Products), Monsanto and American Cyanamid were the principal contributors of nitrogenous wastes, with the Pensacola Northeast STP also contributing. Phosphorus was discharged periodically by Escambia Chemical and Monsanto, but the Pensacola Northeast STP was also named as a significant source.

In the 1975 Olinger et al. study, the most comprehensive documentation of the water quality of the Pensacola Bay system, it was noted that Escambia Bay had the highest total nitrogen (TN) content of the bays in the system, but that TN content of the bay decreased by 50 percent during the period 1967-1974. A later report by the DEP (Young, 1985) contradicted this trend when it noted that the discharges of nitrogenous wastes to the Escambia River and Bay, including the possible release of these compounds from the nitrogen-rich sediments, still posed significant problems to the water quality of the system.

Although substantial efforts to reduce nutrient loading have been initiated, recent information (DER, 1988) suggests a trend of continued increases of TN and TP in Escambia Bay, with the greatest

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concentrations along the northeastern shore of Escambia Bay. Concentrations may be decreasing to the south of this area and into Pensacola Bay, which indicates either assimilation by biological processes, sedimentary incorporation, or advection due to circulation (DER, 1988). In either case, nitrogen remains an extremely important pollutant in the Escambia Bay, and its presence, both historic and contemporary, is well documented. Phosphorus, on the other hand, is most likely the limiting nutrient, and, since it is present in relatively small quantities, excessive algal blooms and accelerated eutrophication are probably deterred because of it. In addition to inducing algal blooms and decreasing DO, elevated phosphorus levels directly stress benthic organisms and fish. This may lead to disease, predation, and a decreased competitive capacity. Organic carbon is present in the water and sediments of Escambia Bay. It is a component of normal biological processes and, unfortunately, is also in several point source industrial waste discharges. Quantities in excess of 2 mg/L are considered problematic. Olinger et al. (1975) indicated that total organic carbon (TOC) throughout the entire Pensacola Bay system uniformly exceeded this quantity. Escambia and Blackwater bays were about equal in TOC, followed by East and Pensacola Bays. It is interesting to note that Olinger et al. (1975) did not observe the distinct patterns of TOC concentrations due to waste discharges as one would expect. Nevertheless, TOC is high throughout the system.

Blackwater and East Bays

These bays, while large spatial components of the Pensacola Bay system, are in many cases in sharp contrast to Escambia and Pensacola bays. Their tributary streams have fewer domestic sewage treatment plant point sources and only one permitted industrial discharge. Of these, the cities of Milton and Crestview represent the most significant pollutant sources. The remaining pollutant sources of significance are the stormwater drainage from Whiting Field, Locklin Lake (formerly heavily polluted by sewer line and lift station failure and since upgraded) and the general drainage from the surrounding agricultural lands.

Dissolved oxygen levels in these bays are fair, with values often falling below the state standard of 4 mg/L in deeper areas (Olinger et al., 1975; Young, 1981). The low assimilative capacity of these bays identified by Olinger et al. (1975) is, in part, caused by poor circulation, which allows for a buildup of organic bottom sediments. Young (1981) confirmed that this condition still exists, referring to the condition as a "noxious sludge layer." It is apparent that all components of the Pensacola Bay system have abundant concentrations of TOC in the sediments.

Biochemical oxygen demand (BOD) is sometimes used as a rough indicator to help understand the relationship between the variations observed in DO in waterbodies. Olinger et al. (1975) conducted only limited BOD tests in the Blackwater/East Bay component and concluded that, in general, it was quite low in Escambia Bay and concluded that BOD was not the controlling factor in the observed monthly variations in DO in that bay. Young (1981) conducted some limited BOD tests in Blackwater/East Bay and found BOD values ranging from 0.3 to 2.5 mg/L, with an average of 1.1 mg/L, a value lower than that for Escambia Bay. East Bay exhibited BOD values of 0.5 - 2.3 mg/L, again lower than the Olinger et al. values for Escambia Bay. It is reasonable, therefore, to conclude that BOD was not a significant contributor to the DO variability in these bays in 1974-78 and in the 1980-81 data from DEP.

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Santa Rosa Sound

Santa Rosa Sound, a lagoon between Santa Rosa Island and the mainland, connects Pensacola Bay with Choctawhatchee Bay in the east. The sound receives relatively little direct freshwater inflow and has an annual mean salinity of 24 ppt (Hand et al., 1996; FDEP, 1993). Hand et al. (1996) assesses water quality in Santa Rosa Sound as good, but notes that it is threatened by NPS runoff from development, as well as ditching and two WWTPs. Effluent originating from golf courses, including some irrigated with treated wastewater, also create adverse biological effects (Lewis, 1997).

Bayous

There are numerous bayous along the shoreline of the Pensacola Bay system. They vary in size, some of the larger ones being Bayou Grande (Escambia County), Bayou Texar (Escambia County), Bayou Chico (Escambia County), Mulatto Bayou, Catfish Basin, Big and Little Sabine Bays (Escambia County), Indian Bayou, Hoffman Bayou (Escambia County), Woodland Bayou (Escambia County), Gilmore Bayou (Escambia County), Thompson's Bayou (Escambia County), Tom King Bayou, and Trout Bayou. Along with the upper reaches of the bays, seagrass beds, and the Pensacola Bay pass, these bayous were, and in some cases remain, centers of biological productivity within the estuarine system. They are sources of nutrients and detritus, which enhance primary productivity and thereby provide food for herbivores and detritivores.

All bayous have been impacted to some extent by human activities. Three of the more heavily impacted bayous are Bayou Chico and Bayou Texar in Escambia County, and Mulatto Bayou in Santa Rosa County. Stormwater runoff tends to concentrate within bayou waters and thus tends to concentrate related adverse impacts. There are additional factors which cause the bayous to be particularly susceptible to inputs of pollutants. Because bayous have a much smaller surface area and are much narrower than the open bay, the small fetch limits the size of waves which can be generated. This decreases the amount of mixing and promotes stratification and low DO levels. Some bayous have restricted inlets, which also tends to decrease mixing of upper and lower layers (caused by thermal and density gradients). Because of the decreased mixing and the resulting stratification, oxygen is not transported from the upper layer to the lower layer, and, therefore, this lower layer often exhibits anoxia (depletion of dissolved oxygen), particularly when there are inputs of oxygen demanding pollutants.

Mulatto Bayou

Mulatto Bayou is a moderately sized bayou on the eastern shore of Escambia Bay, which has had a long history of poor water quality and fish kills. The waters of Mulatto Bayou have been affected by residential development and canal dredging. Olinger et al. (1975) and Adams (1972) reported that a total of 19 fish kills occurred in the Mulat-Mulatto Bayou complex during the period 1970 through 1974. This was second only to Escambia Bay in the total number of fish kills occurring in the Escambia Bay System during this period. Since the mid-1970s, very little information has been obtained for Mulatto Bayou.

Other Bayous

Most of the other bayous have not been extensively evaluated for water quality or habitat problems or for control of pollution sources. Adams (1972) compared phytoplankton primary productivity and related parameters in Mulatto Bayou and Catfish Basin, two ecologically similar estuarine bayous. Mulatto Bayou has been subjected to many anthropogenic disturbances, while Catfish Basin remains a relatively pristine habitat. Other bayous also warrant special attention and exceptional protection

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~~from current and future inputs of pollution due to the role they play in the biological health of the system. Much of this can hopefully be accomplished through increased efforts in stormwater management and improved land use controls.~~

- Phase 1: Development of the Planning List

  During the first phase of any basin rotation cycle, the Department initially evaluates all readily available water quality and biological data, using the methodology described in the IWR. During this phase, water segments that are identified as potentially not meeting water quality standards are included on a Planning List.

- Phase 2: Development of the Verified List of Impaired Waters

  During the second phase of the basin rotation, the Department implements additional sampling and strategic monitoring activities, focusing on those waters that were identified and placed on the Planning List during the first phase of the basin rotation. The goal of these activities is to ensure that sufficient data and/or ancillary information are available to determine (i.e., to "verify")—using the methodology described in the IWR—whether a waterbody segment is impaired and if the impairment is caused by a pollutant. In conjunction with the determination of impairment status, the Department actively solicits stakeholder input, and assessment results are finalized at the end of the second phase based on available data.

  To conclude the second phase of the basin rotation, after the assessments have been completed, those waterbody segments identified and verified as impaired are placed on the state's Verified List of impaired waters. Correspondingly, those waterbody segments determined to be no longer impaired or in need of a TMDL are placed on the Delist List. Both the Verified and Delist Lists are adopted by Secretarial Order and submitted to the EPA to update the state's 303(d) list.

  Waterbody segments identified as not meeting water quality standards due to a pollutant are prioritized for TMDL development. The priority ranking considers the severity of the impairment and the designated uses of the segment, taking into account the most serious water quality problems, most valuable and threatened resources, and risk to human health and aquatic life.

  Segments verified as impaired are initially assigned a medium priority. A high priority is assigned if: (1) the impairment poses a threat to potable water supplies or to human health, or (2) the impairment is due to a pollutant that has contributed to the decline or extirpation of a federally listed threatened or endangered species. Impairments due to exceedances of fecal coliform criteria are assigned a low priority. Waters listed due to fish consumption advisories for mercury are designated high priority. In September 2012, the Department adopted a statewide mercury TMDL that requires an 86% reduction in all emission sources.

  The Department intends to address all listings with a high priority within five years after they are added to the Verified List, to address listings with a medium priority within five to 10 years (subject to available resources), and to address listings with a low priority within 10 years.

- Phase 3: TMDL Development

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The third phase of the basin rotation cycle consists primarily of TMDL development and is initiated when the Verified List is adopted by Secretarial Order. When TMDLs are completed for segments on the Verified List, they are adopted by rule, and those segments are subsequently removed from the state's Verified List of impaired waters.

- Phases 4 and 5: BMAP Development and Implementation

  During the fourth phase of the watershed management cycle, a BMAP aimed at reducing the pollutant loads linked to the verified impairments may be developed, and implementation is initiated in the fifth phase of the basin rotation cycle to achieve the pollutant reduction goals of the TMDL.

Source: Florida Department of Environmental Protection, 2014 Integrated Report

~~6.3.5.9.1~~ Water Quality Monitoring in Santa Rosa Co~~o~~unty

Santa Rosa County currently relies on the state's water quality monitoring program, including the Florida Healthy Beaches program and FDEPs monitoring program. Florida's integrated approach to water quality monitoring and assessment consists of three tiers: statewide ambient monitoring networks for status and trends, strategic monitoring for verification of impairment and identification of causative pollutants, and specialized, site-specific studies. -

~~waters suitable for recreation and fish and wildlife maintenance and propagation.~~

The Status Network component of the ambient monitoring program is a probabilistic assessment that is used to develop statistical estimates of water quality across the entire state, based on a stratified random sample design. The use of probability assessments produces an unbiased picture of water quality conditions statewide and provides a cost-effective benchmark of the success of Florida's water quality programs. The results can also provide information on whether it would be useful to target certain waters for further assessment, or if limited resources for water quality assessment can be used more effectively in other ways. The Florida Department of Environmental Protection ~~(the Department)~~ also implements a Trend Monitoring Network consisting of 76 surface water and 49 ground water stations (several of which are located in or near Santa Rosa County). Trend analyses for surface and ground water resources are used to examine changes in water quality over time. Florida's statewide Status and Trend monitoring networks (the first tier) enable the Department to satisfy some of the reporting requirements for Sections 106 and 305(b) of the CWA.

A variety of basin- and waterbody-specific assessments are conducted as part of the second tier monitoring, or Strategic Monitoring. The primary focus of strategic monitoring is to collect sufficient data to verify whether waters that have limited data indicating they are potentially impaired are in fact impaired and, to the extent possible, determine the causative pollutant for waters listed for dissolved oxygen (DO) or biological assessment (bioassessment) failures. However, the Department also conducts other types of strategic monitoring to better evaluate specific water resources (springs, for example).

Site-specific monitoring (the third tier) includes intensive surveys for TMDLs, monitoring for the development of water quality standards and site-specific alternative criteria (SSAC), and fifth-year inspections for permit renewals for facilities that discharge to surface waters. Special monitoring programs are used to address other program-specific needs, such as monitoring to develop predictive models, including the mercury TMDL being developed for Florida. Ground water arsenic studies address natural versus anthropogenic sources of arsenic in aquifers, and restoration efforts are measured by project-specific studies.

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As part of Florida's Healthy Beaches Program, which began in 1998, FDOH monitors the state's coastal beaches for elevated levels of bacteria. In August 2000, the beach water sampling program was extended to all 34 of Florida's coastal counties through state legislation (Senate Bill [SB] 1412 and House Bill [HB] 2145) and funding. With additional funding from the EPA in 2002, the program was expanded to include weekly sampling for fecal coliform and enterococci bacteria at 304 beach locations throughout Florida.

The program ~~has undergone~~underwent changes in 2011 to reflect the current budget situation. These changes have led to a statewide baseline program that consists of biweekly (every two weeks) sampling for enterococci bacteria and the discontinuation of fecal coliform sampling. Also, year-round sampling will continue only in 15 counties, including Volusia County, those counties south of Pasco County on the west coast, and those counties south of Brevard County on the east coast. In the remaining counties , biweekly sampling will occur from March 1 through October 31. In addition, the geometric mean will no longer be used as a water quality indicator in this monitoring program. If local funding is available, some counties may still sample weekly for enterococci and maintain fecal coliform testing and the geometric mean as a standard.

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The presence of elevated levels of these bacteria in water is an indication of possible pollution that may come from stormwater runoff, pets, wildlife, or human sewage. While not necessarily pathogenic, their presence in high concentrations in recreational waters indicates that pathogens may be present. If waste pathogens are present and they are ingested while swimming, or if they enter the skin through a cut or sore, the bacteria may cause illness. The most commonly reported ailments are gastrointestinal distress and skin rashes. The rationale for selecting enterococci for analysis and the implications of the sampling results are described in more detail on the FDOH Florida Healthy Beaches Program website.

When a sample exceeds the single sample maximum of 104 colony-forming units per 100 milliliters of water (CFU/100mL) of enterococci, a resample to confirm the exceedance may be taken immediately; upon confirmation of the exceedance a public health advisory is issued. If a resample is not collected, a public health advisory is issued immediately. Local media are alerted and the public is notified by way of the media, the Healthy Beaches Program website, and signs posted at the particular beach under advisory.

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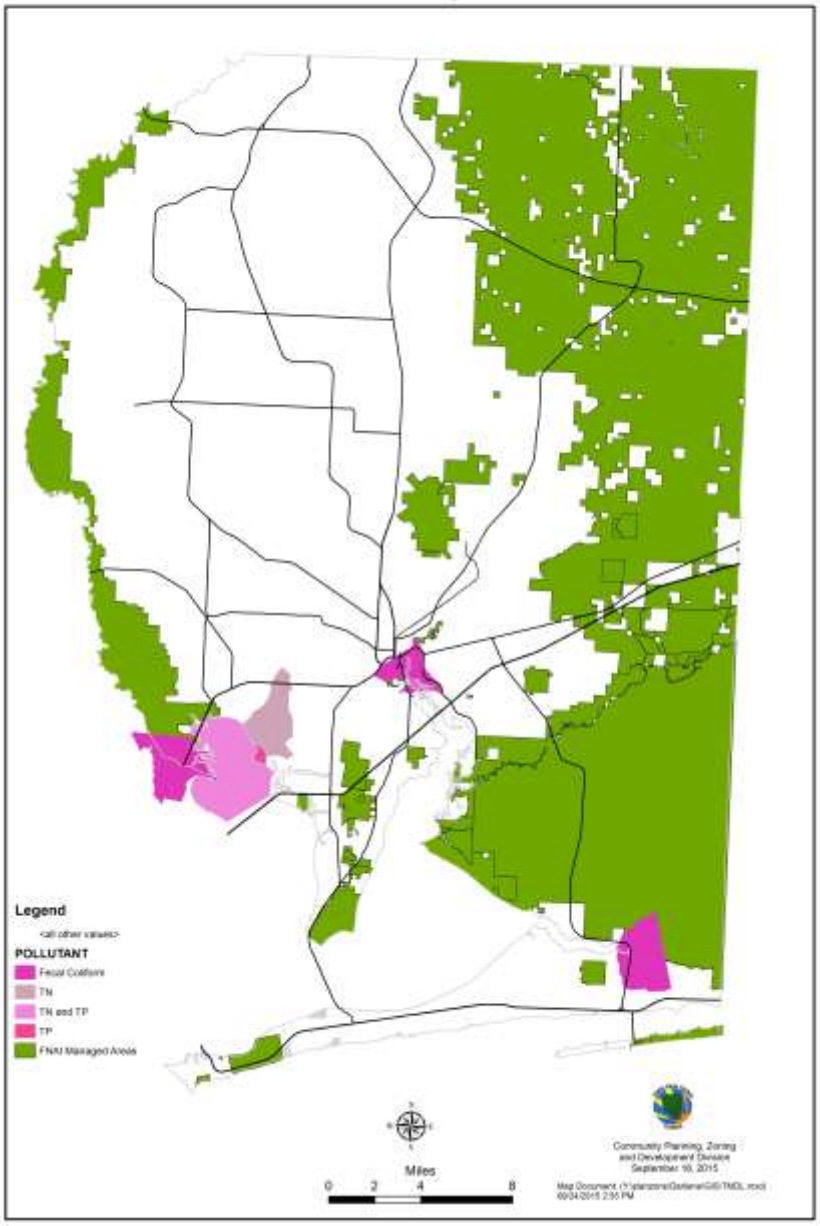
Map 6-7 Adopted TMDLs and Managed Areas
Santa Rosa County, Florida



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~~E.~~ 6.3.6 Wetlands

~~E.1 General~~

Wetlands are transition zones between water areas and dry land. These lands are dominated by water saturated soils (hydric soils) on a periodic or permanent basis. The extent and persistence of the transition zone is dependent upon the availability of water supplied from surrounding uplands and the surface elevation of adjacent waters. The location, extent, and persistence of wetlands is determined by several factors including: climatic conditions that result in long term reductions of water to adjacent uplands, climatic changes that result in a long-term rise or lowering of the ocean water levels, drainage programs that remove water and reduce infiltration potentials on adjacent uplands and subsequent aquifer recharge areas, and finally infiltration to surface water elevations at the base elevation, or to the receiving water body.

~~When wet or hydric soils are drained or are no longer supplied with ground water seepage from adjacent higher elevations, these soils become incapable of supporting wetland vegetation. Under these conditions, the U. S. Fish and Wildlife Service no longer considers the soils as wetlands (Classification of Wetlands and Deepwater Habitats of the United States, FWS/OBS-79/31). This basic criterion also is generally followed by the State of Florida.~~

In Santa Rosa County, three distinct conditions provide the basis of local area wetlands. These conditions include: sea level conditions that establish the extent of wetlands in the Escambia, Blackwater, Yellow and East River estuaries; climatically determined rainfall resulting in freshwater discharges that establish the seasonal water elevations in Escambia Bay, East Bay, Blackwater Bay and Santa Rosa Sound; and winter temperatures that essentially determine the maximum annual height of water table conditions or the top of the sand and gravel aquifer and the existence of upland depressional and drainage way wetlands. The ~~wetland areas of the~~ County ~~are depicted on the Future Land Use Map Series entitled~~utilizes the National Wetlands Inventory Map and Potential Wetlands by Soil Type (Hydric Soils) Map (**Maps 6-~~XXX~~8)** and **6-~~XXX~~9**) for identification of potential wetland areas.

~~Florida Wetland Determination Criteria~~

~~Criteria for determination of State of Florida jurisdictional wetlands are set forth in Rule 17-4.020, Determination of the Landward Extent of Surface Waters of the State, Florida Administrative Code. Determination of wetlands begins with the identification of the landward extent of surface water and an inspection of vegetation while moving landward. Wetlands are areas subject to regular and periodic inundation considering the occurrence of the following indicators: hydrological data, secondary flow channels, high water marks, drift lines, rafted debris, hydric soil characteristics, recent alluvial soils, periphyton, algal mats, signs of aquatic invertebrates such as crayfish burrows and fiddler crab burrows, hydric adventitious roots, buttressed tussocks or hummocks, and moss and lichen lines. In no case shall the landward extent of waters of the State extend above the elevation of the one in a 10-year recurring flood event.~~

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~~E.2 Wetland Types~~

~~E.2(a) Coastal Strand~~

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~~Coastal strand is actually an upland but it is worth mentioning because it is an occurrence within this Region. Coastal strand occurs on well-drained sandy soils and includes the typical zoned vegetation of the upper beach, nearby dunes and coastal rock formations (Closing the Gaps in Florida's Wildlife Habitat Conservation System, 218). A Coastal strand generally occurs in a narrow band parallel to open waters of the Atlantic Ocean and the Gulf of Mexico, and along south shores of some saline bays or sounds in both north and south Florida. This community occupies areas formed along high-energy shorelines, and is influenced by wind, waves, and salt spray. Vegetation within this community consists of low growing vines, grasses, and herbaceous plants with very few small trees or large shrubs. Pioneer or early successional herbaceous vegetation characterizes the foredune and upper beach, while a gradual change to woody plant species occurs in more protected areas landward (Ibid., 218). Typical plant species includes beach morning glory, railroad vine, sea oats, saw palmetto, Spanish bayonet, yaupon holly, and wax myrtle. The coastal strand community only includes the zone of early successional vegetation that lies between upper beach, and more highly developed communities landward (Ibid., 218).~~

~~E.2(b) Coastal Saltmarsh~~

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~~Wetlands in this Region, such as coastal saltmarsh or tidal marshes are found throughout the world along protected coastlines in the middle and high latitudes. These herbaceous and shrubby wetlands communities occur statewide in brackish waters along protected low-energy estuarine shorelines of the Atlantic and Gulf Coasts (Closing the Gaps In Florida's Wildlife Habitat Conservation System, 218). Saltmarshes are often dominated by the grass *Spartina* in the low intertidal zone and the rush *Juncus* in the upper intertidal zone. Plants and animals in these systems have adapted to the stresses of salinity, periodic inundation, and extremes in temperature (Ibid., 218). Table 11-3 lists the tidal marshes in Santa Rosa County:~~

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~~Table 11-3~~

~~Santa Rosa County Estuaries~~

~~Estuary~~	~~County~~	~~**Tidal Marshes (Acres)**~~
~~Santa Rosa Sound~~	~~Santa Rosa, Escambia~~	~~309~~
~~**East Bay**~~	~~Santa Rosa~~	~~3,307~~
~~**Escambia Bay**~~	~~Santa Rosa, Escambia~~	~~5,152~~
~~**TOTAL**~~		~~**8,768**~~

6.3.6.1 Wetland Preservation

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The County maintains a comprehensive approach to wetlands protection, including the following components:

1) Preservation: In 2008~~15~~, approximately 45~~51~~% of all wetlands within Santa Rosa County were under public ownership and 35~~40~~% were designated for Conservation/Recreation use on the

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Future Land Use Map. The County will continue to support the purchase and preservation of wetlands. In addition, wetlands have been preserved as part of private land purchases required for mitigation. The County will work with the FDEP and the USACOE to identify the location of these mitigation wetlands and designate those areas as Conservation/ Recreation on the Future Land Use Map.

2) Future Land Use Map: The land use categories shown on the Future Land Use Map take into consideration the compatibility of development with wetland resources. Undeveloped areas of the County with the largest concentrations of wetlands have been designated for low density development. Wetlands under public ownership have been designated for Conservation/Recreation use.

3) Avoidance, Minimization of Impact, and Mitigation: Land development projects in Santa Rosa County must be designed to avoid or minimize impact on jurisdictional wetlands. Where avoidance or minimization is not possible, wetland impacts may be mitigated as required by the agency or agencies having jurisdiction. Where avoidance or minimization is possible, the County will not issue a permit for development within jurisdictional wetlands, except for incidental impacts such as those required for access to the site, internal circulation, infrastructure, boardwalks, etc.

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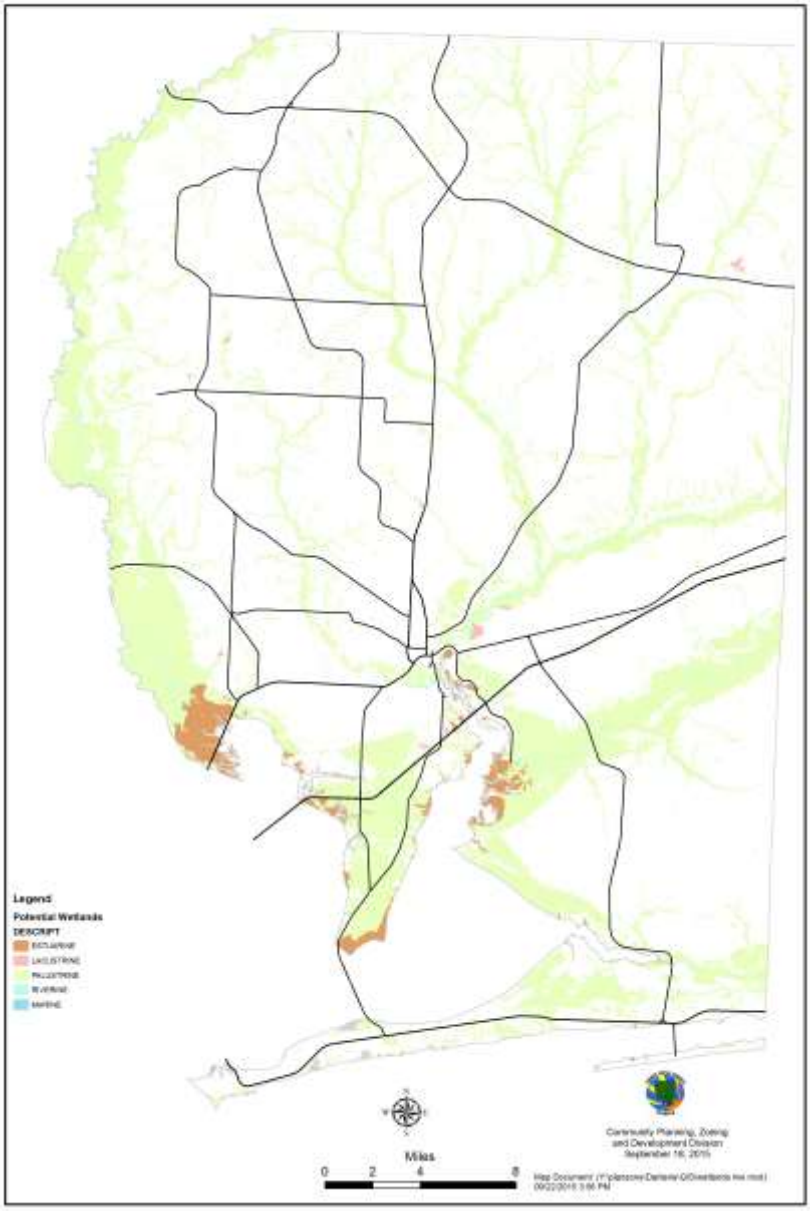
Map 6-8 National Wetlands Inventory
Santa Rosa County, Florida



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Northwestern Florida Ecological Characterization: An Ecological Atlas, United States Department of Interior, 4.

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E.2(c) Freshwater Marshes

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Inland from the Saltmarshes, but still close enough to the coast to experience tidal effects, are freshwater marshes. These wetlands are dominated by a variety of grasses, and annual and perennial broad-leaved aquatic plants. These wetlands communities are dominated by a variety of herbaceous plant species growing on sand, clay, marl, and organic soils in areas of variable water depths and inundation regimes (Closing the Gaps In Florida's Wildlife Habitat Conservation System, 219). These types of marshes occur in deeper, more strongly inundated situations and are characterized by tall emergent and floating-leaved species. Freshwater marshes occur within depressions, along broad, shallow lake and river shorelines, and are scattered in open areas within hardwood and cypress swamps (Closing the Gaps In Florida's Wildlife Habitat Conservation System, 219).

E.2(d) Cypress Swamps

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Cypress swamps are regularly inundated wetlands that form a forested border along rivers, creeks, lakes, or occur in depressions as circular domes or linear strands (Ibid., 219). These communities are strongly dominated by either bald cypress or pond cypress, with very low numbers of scattered black gum, red maple, and Sweetbay. The understory and ground cover are usually sparse because of frequent flooding but sometimes includes such species as buttonbush, lizard's tail and various ferns (Ibid., 219).

E.2(e) Hardwood Swamps

Hardwood swamps are composed of either pure stands of hardwoods, or occur as mixtures of hardwood and cypress. This association of wetlands adapted trees occurs throughout the state on organic soils and forms the forested floodplain of non-alluvial rivers, creeks, and broad lake basins (Closing the Gaps In Florida's Wildlife Habitat Conservation System, 219). Tree species that are found include a mixed overstory of black gum, water tupelo, bald cypress, dahoon holly, red maple, swamp ash, cabbage palm, and sweetbay (Ibid., 219).

E.2(f) Bay Swamp

Bay swamp is a type of hardwood swamp that contains broadleaf evergreen trees. These trees occur in shallow, stagnant drainage or depressions often found within pine flatwoods, or at the base of sandy ridges where seepage maintains constantly wet soils (Ibid., 219). The soils, which are usually covered by an abundant layer of leaf litter, are mostly acidic peat or muck that remains saturated for long periods but over which little water level fluctuation occurs (Closing the Gaps In Florida's Wildlife Habitat Conservation System, 220). Overstory trees within bayheads are dominated by sweetbay, swamp bay, and loblolly bay. Depending on the location within the state, other species including pond pine, slash pine, blackgum, cypress, and Atlantic white cedar can occur as scattered individuals, but bay trees dominate the canopy and characterize the community. Understory and ground cover species may include dahoon holly, wax myrtle, fetterbush, greenbriar, royal fern, cinnamon fern, and sphagnum moss (Closing the Gaps In Florida's Wildlife Habitat Conservation System, 220).

E.2(g) Shrub Swamps

Shrub swamps are wetlands communities dominated by dense, low-growing, woody shrubs or small trees. Shrub swamps are usually characteristic of wetlands areas that are experiencing environmental change, and are early to mid-successional in species complement and structure. These changes are a result of natural or man-made agitations due to increased or decreased hydroperiod, fire, clear cutting or land clearing, and siltation. One species may dominate Shrub swamps, such as willow, or any variety of opportunistic plants may create a dense, low canopy. Common species include willow, wax myrtle, primrose willow, buttonbush, and saplings of red maple, sweetbay, black gum, and other hydric tree

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species indicative of wooded wetlands (Closing the Gaps in Florida's Wildlife Habitat Conservation System, 220).

In the southeastern United States, the low marshes are characterized by large growths of the tall salt marsh cordgrass (Spartina alterniflora). In the higher regions of the marshes, normal indicators are black rush (Juncus roemarianus) and short spartina marsh grass or salt meadow cordgrass (Spartina Patens). In the upper irregularly flooded areas of the salt marshes where fresh water is more abundant, hammock environments characterized by bull rushes (Scirpus spp.), marsh elders (Iva spp.), palmettos (Sabal spp.), and various low scrubs often form a boundary zone environment. In those areas where ground water seepage emerges adjacent to salt marshes, a gradual transition zone from saltwater dominated species to fresh water wetland species may occur.

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The varied aquatic environments within estuarine systems serve as feeding and nursery grounds for many marine and estuary fish. Probably the more common estuarine fish observable is the mullet (Mugil cepahalus), which spends most of its life as a strict detritus-algal feeder. A wide range of commercial and sports fish species spend part of their lives within the estuary system. Numerous species spawn in Gulf waters and migrate into the estuary as fry. After using the estuary as a nursery and development area, these species migrate back to the Gulf. Other species move back and forth and use the estuary waters as a feeding area. The biological productivity of the estuary has a significant effect upon the availability of a wide variety of near shore ocean species of fish.

The estuarine system also serves as breeding and nursery grounds for various crustaceans, such as fiddler crabs (Uca Pubilator) and blue crabs (Callinectes). The intertidal and subtidal areas are habitats for the eastern oyster and hard shell clam. Marine finfish and shellfish that utilize the estuary typically move through inlets to various near shore ocean areas. Finfish and shellfish caught in Santa Rosa County in bays and along the shore of the Gulf that utilize the estuary system will reflect the wholesomeness of the estuary environment.

E.2(h) Tributary Stream Wetlands

Mixed wetland forests (FLUCCS 630) occupy the hydric soil dominated floodplains of all streams in Santa Rosa County. Along streams draining to the Escambia, Blackwater and Yellow Rivers at locations with land elevations subject only to periodic flooding, mixed broad-leafed deciduous forest become dominant. On still slightly higher lands with moist to occasionally saturated soils at the edges of floodplains, broad-leafed and needle-leafed evergreen trees become pronounced.

The upland limits of wetland forests along stream courses in Santa Rosa County are difficult to determine. Based upon flooding from the stream discharges, stream floodplain wetlands will occur at elevations below the 10-year flood discharge water elevation level. However, the lower courses of streams flowing off of the plateau or the terraces of Santa Rosa County are incised or have cut channels into the edges of the plateau. Where water table conditions still provide sufficient ground water seepage from the sides of the incised stream courses, wetland vegetation can persist to higher land elevations. As development continues in Santa Rosa County and water tables are lowered, vegetation along the sides of these streams can be expected to change gradually from predominately wetland species to mesic species.

E.2(i) Freshwater Upland Wetlands

In stream headwater wetlands, mixed wetland forests (FLUCCS 630) occupy the extensive and randomly distributed small and large depressions. Isolated depressions often have dominant stands of one or a few wetland tree species. In many cases, species dominating specific depressions extend into the shallow

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drainage ways that under high runoff conditions provide a passageway for stormwater runoff drainage to stream courses.

Wetlands exist in upland depressions, along floodplains of streams, and along the edges of base receiving water areas (upland depressions, lakes, and ponds). All wetlands have one primary characteristic; all wetlands are either receiving or transition locations for runoff of surface waters and seepage of ground waters. Wetlands function as nutrient sinks or temporary storage areas for surface water runoff. In that capacity, all wetlands function to delay the movement of water. The time delay of water movement through wetlands allows biological and chemical actions to reduce detrital materials and provides time for the chemical bonding of conservative materials to sediment fines in the wetland. The sediment fines are introduced into the wetland through runoff or are created within the wetland through biological or chemical detrital reduction actions.

E.3 Wetlands Quality

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Wetlands can persist only when they are able to regularly receive controlled amounts of surface water runoff and ground water seepage from the adjacent upland watershed supplying the depressional area. Once drainage programs alter the natural movement of water from the adjacent uplands or drain water to other locations, the original wetland begins a slow process of change.

Forested wetlands or swamps, bayheads, and hydric hammocks are primary sources of Cypress and a variety of hardwoods used for commerce in Florida. As the uplands that formerly supplied the surface water runoff and ground water that seeped into these areas are converted to agricultural and urban land uses and the natural movement of water is altered, these areas also begin a gradual conversion to mixed mesic woodland or pine flatwood communities.

Without the regular supply of water from runoff and water table gravity flow from adjacent higher land areas, upland wetlands and their associated vegetation can be expected to gradually convert to areas with different soil characteristics and with different vegetation characteristics. The preservation of upland wetlands requires the hydrological determination of the regime of surface water flow and ground water movement to the depression. Engineering estimates can establish the water requirements essential for sustaining a depressional area as a wetland with some desired vegetation characteristics.

In areas where the water table has been dropped through water withdrawals and drainage of surface waters, temporary sustenance of wetlands persists due to the compacted bottoms of wet depressions that prevent or retard the infiltration and percolation of surface water into the ground. In these areas of perched water tables, the perched condition will persist for some time. As the available ground water declines beneath the bottom of a perched depression, vegetation roots gradually can be expected to penetrate the impervious clay layers of the depression bottom in their search for water. Gradually, percolation through the formerly impervious bottom of the depression can be expected to slowly increase through the culmination of life cycles of vegetation growth, progressive generations of this process, and subsequent root reconversion to natural elements.

The above process also occurs in Florida's flatwoods where the high water table conditions form hardpans one or more feet below the surface of soils. The hardpans slow the penetration of water downward to the sand and gravel aquifer. When these areas are drained, tree roots eventually penetrate through the hardpan layers, and after tree senescence, decayed root areas leave voids that provide conduits for water to penetrate from the perched water tables to the surficial aquifer. Any road cut, structure foundation, posthole, or other soil preparation activity that fractures local hardpans can provide similar conduit connections from perched water tables to the sand and gravel aquifer. As a result, the natural conditions that resulted in perched water tables and discontinuity between localized water tables and the extended

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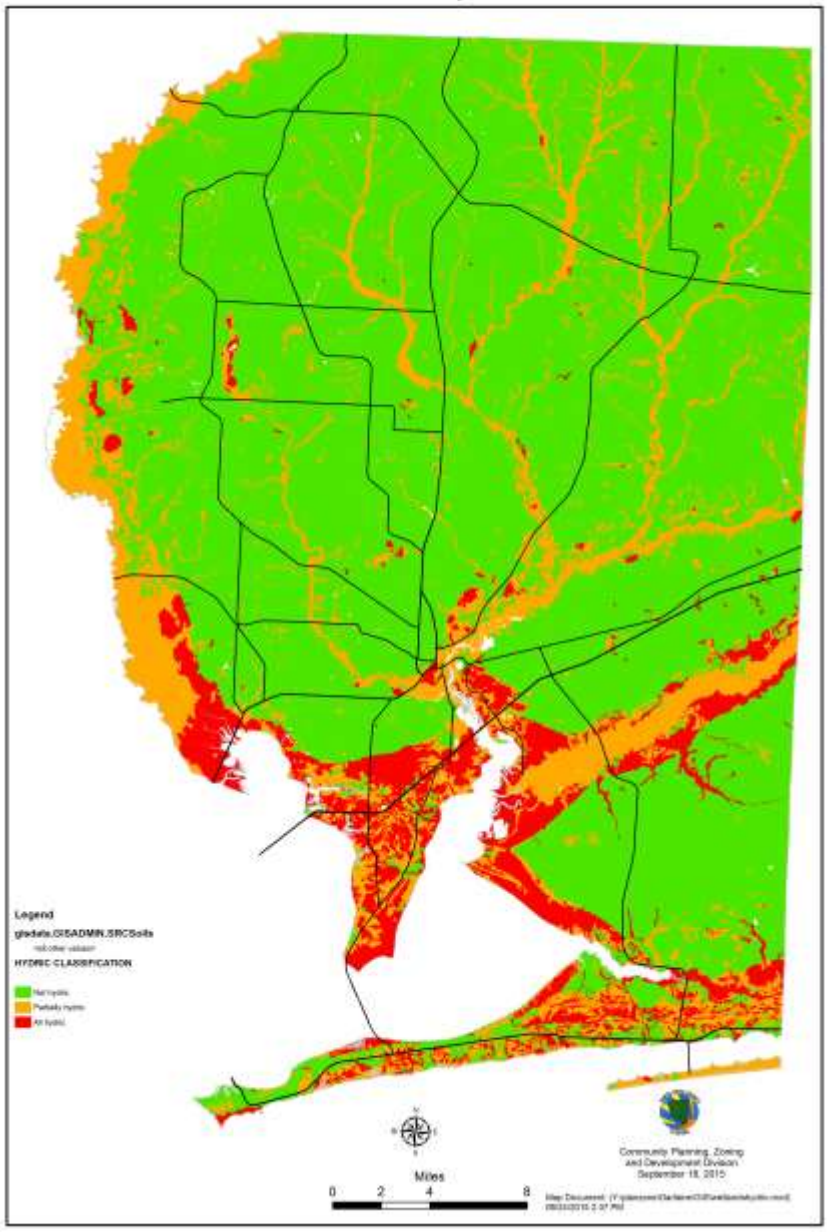
~~ground water source termed the sand and gravel aquifer are being altered by natural conditions and by human activities. Where any type of development is occurring, it no longer is practical to consider the natural discontinuity between perched water tables and the larger ground water body of the sand and gravel aquifer can be maintained as separate ground water conditions.~~

Map 6-9 Wetlands Classified by Hydric Classification
Santa Rosa County, Florida



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6.3.7 Floodplains

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~~F.1 General~~

Floodplains are areas inundated by a 100-year flood event or identified by the National Flood Insurance Program of the Federal Emergency Management Agency as an "A" zone or a "V" (Velocity) zone on the County's Flood Insurance Rate Maps or Flood Hazard Boundary Maps. Floodplains serve as storage areas for floodwaters caused by overflowing waterways and for stormwater runoff from the upland areas. They protect uplands from the erosion caused by overflowing waterways as well as provide habitat for a number of wildlife and vegetative species.

The 100-year floodplains in the County are located adjacent to the bays, rivers and their tributaries, Santa Rosa Sound, and the freshwater marshes in the interior of the County. Along the bays, the Gulf, and Santa Rosa Sound are the "V" zones. These areas are depicted on the ~~Future Land Use Map Series entitled Rivers, Bays, Lakes, Floodplains, Beaches, Shores, and Estuaries Map.~~ Map 6-10, this map is a spatial analysis of FEMA designated Special Flood Hazard ~~Zones~~Areas (SFHAs) as compared to Agricultural, Conservation (including Navarre Beach) and Park (including Navarre Beach) zones. The graphic below shows a river system floodplain.

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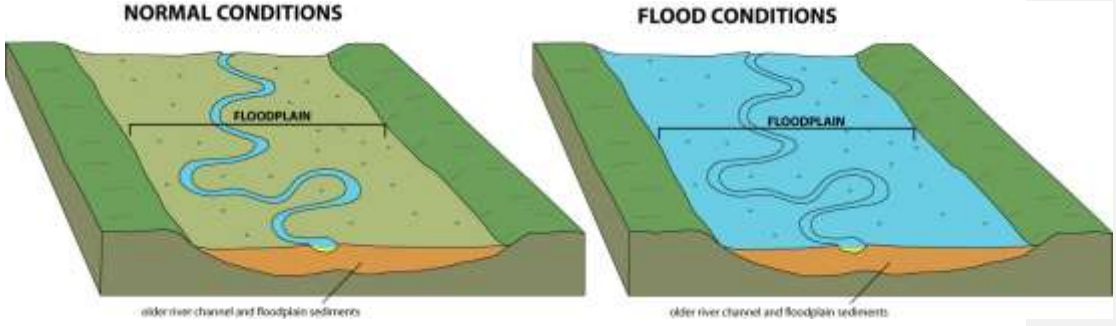

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~~Floodplains serve as storage areas for floodwaters caused by overflowing waterways and for stormwater~~

~~Map 11-1 (Appendix A) is a spatial analysis of FEMA designated Flood Hazard Zones as compared to Agricultural, Conservation (including Navarre Beach) and Park (including Navarre Beach) zones.~~

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~~F.2~~6.3.7.1 National Flood Insurance Program Base Elevations

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The U.S. Congress passed The National Flood Insurance Act of 1968 by Title XIII of the Housing and Urban Development Act of 1968 (Public Law 90-448), as subsequently amended, in an effort to: reduce the increasing costs to taxpayers; reduce the ineffectiveness of flood damage protection measures; and, reduce the number of incidents of flood related damages. This Act established the National Flood Insurance Program administered by the Federal Emergency Management Agency. Santa Rosa County participates in this program.

Section 9 of the Coastal Barrier Resource Act (COBRA) amended section 1321 of the National Flood Insurance Act of 1968 (Insurance Act), 42 U.S.C. 4028, to prohibit the sale of new flood insurance coverage by the National Flood Insurance Program (NFIP) on or after October 1, 1983, for any new construction or substantial improvements of structures located within the Coastal Barrier System established by section 4 of the COBRA Act. Additionally, Section 9 amended section 1321 of the Insurance Act by re-designating the existing provisions as subsection (a). The result of this amendment was to continue the ban on new flood insurance in areas already within the System and to make the ban effective upon enactment of the 1990 Act in areas added to the System by the 1990 Act. As of November 16, 1991, one year after enactment of the 1990 Act, Federal Flood insurance will no longer be available for new structures or substantial improvements of existing structures in any areas identified on the map as an "otherwise protected area."

The philosophy behind COBRA is that risk associated with new development in these areas should be borne by those who choose to live and work along the coast, and not by all American taxpayers. By restricting Federal expenditures and financial assistance on specific undeveloped coastal barriers, the Federal Government can minimize the loss of human life, reduce the unnecessary expenditure of Federal revenues, and reduce the damage to fish and wildlife and other natural resources that can accompany development of these fragile areas. These are the stated purposes of the Coastal Barrier Resource Act (Section 2(b)). Section 10 of COBRA directs the Department of the Interior to study the CBRS and prepare for Congress a report that includes recommendations for changes in the CBRS based on an evaluation of management alternatives that would foster conservation of the natural resources of the CBRS (Ibid., 1).

The Federal Emergency Management Agency (FEMA) completed the Flood Insurance Study (FIS) for the unincorporated areas of Santa Rosa County (Community Number 120274), dated November 1, 1985. Since this time, the FEMA maps for the southern portion of the County were revised in January 2000 to take into account changes caused by Hurricanes Erin and Opal in 1995. This study includes peak discharges, floodway, and base flood elevations for the applicable floodplain areas within the County. The study includes elevations for the 10-year, 100-year, and 500-year return frequency floods. The 10-year flood elevation provides guidance on the areas of floodplains below which combined ground water seepage areas and surface waters support wetlands. The 100-year flood elevation is the base flood elevation above which the first inhabited floor of structures are to be built in accordance with the requirements of the National Flood Insurance Program and the County's Land Development Regulations, which require one (1) foot above the base flood elevation. The 500-year flood elevation provides guidance on the base elevation used by the Federal Government for the design and construction of hazardous materials storage and hazardous waste facilities.

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The Flood Insurance Study for Santa Rosa County also includes information on floodways for the lower courses of selected streams. Regulatory floodway information provides guidance on the cross sectional area of 100-year floodplain required to pass the base flood storm discharge without raising the base floodplain elevation more than 1 foot. The floodplain area not required to pass the 100-year base flood discharge and beyond the limits of the regulatory floodway is termed the regulatory flood-fringe. This portion of the regulatory floodplain usually has shallow and slow moving floodwater under the conditions of the 100-year flood event. Under lesser flood conditions, fringe areas often are not flooded. Flood fringe areas often may be used for development by raising the first floor of structures above the base flood elevation.

6.3.7.2 ~~M.3~~ Floodplain Protection Measures

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The purpose of the National Flood Insurance Program is to protect lives and development from flooding; it does not preclude development in the 100-year floodplain. The County had adopted Land Development Regulations, which address building in the floodplain. The Land Development Regulations requires that the first floor of inhabitable living space be built 1 ft. above the designated base elevation as determined by the Flood Insurance Rate Maps.

The fill required by the base elevations reduces the flood storage capacity of the floodplains; however, storage compensation is provided by the storage of stormwater on site as required by the Northwest Florida Water Management District in two rules: 40C-42 and 40C-40 and by the County's Land Development Regulations, which regulates stormwater for development under the District's thresholds.

A majority of the floodplains are protected from development because most of the floodplains are coterminous with freshwater and estuarine wetlands. These wetlands are regulated by dredge and fill rules of the Department of Environmental Protection and the Army Corps of Engineers.

Santa Rosa County has taken steps to further protect floodplains from development using zoning measures. These zoning categories preclude high density private development, in favor of resource conservation or low intensity public use. As the spatial analysis illustrates, significant portions of the Flood Hazard Zones associated with the Escambia River, Blackwater River and Yellow River have been zoned for uses that do not include dense development or highly intensive uses. Portions of Navarre Beach in both Flood Hazard Zone AE (100-year flood plain) and Zone VE (100-year flood plain with wave action) have also been zoned for park or conservation uses. This action reduces the amount of development in high hazard areas and will significantly lower losses from future flood events.

Santa Rosa County also participates in the National Flood Insurance Program's (NFIP's) Community Rating System (CRS). The CRS is a voluntary incentive program that recognizes communities for implementing floodplain management practices that exceed the Federal minimum requirements of the NFIP to provide protection from flooding.

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In exchange for a community's proactive efforts to reduce flood risk, policyholders can receive reduced flood insurance premiums for buildings in the community. These reduced premiums reflect the reduced flood risk resulting from community efforts toward achieving the three CRS goals:

1. Reduce flood damage to insurable property
2. Strengthen and support the insurance aspects of the NFIP
3. Encourage a comprehensive approach to floodplain management

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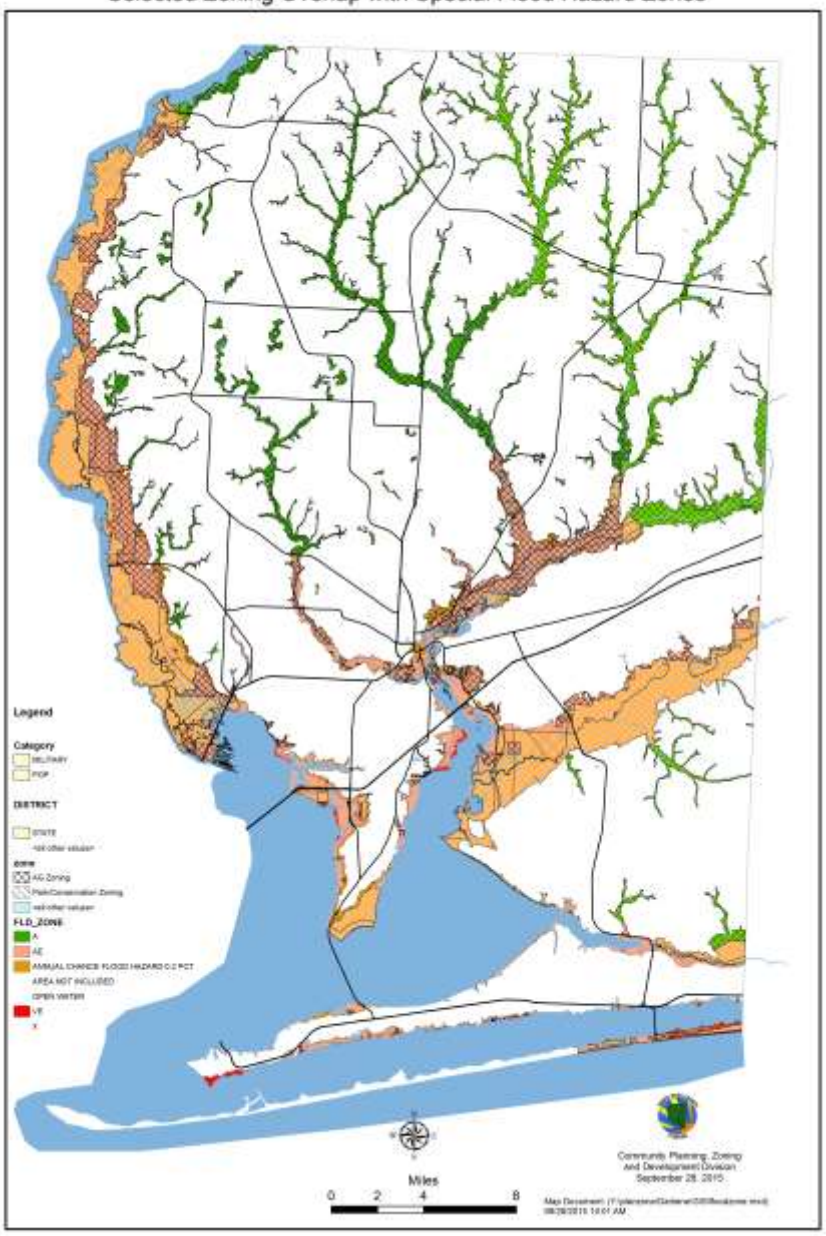
Map 6-10 FEMA Analysis
Santa Rosa County, Florida
Selected Zoning Overlap with Special Flood Hazard Zones



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~~G.~~6.3.8 Air Resources

Florida's statewide air quality monitoring network is operated by nineteen state, local, and private environmental programs. The air is monitored for carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO_2), ozone (O_3), particulate matter (or particle pollution [PM10 and PM2.5]), and sulfur dioxide (SO_2). The monitors tend to be concentrated in areas with the largest population densities. Not all pollutants are monitored in all areas.

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The department's Florida's Air Quality System provides the public and units of local, state, and federal government with measurements of pollutant concentration levels in the ambient air - ambient air being generally defined as that portion of the atmosphere near ground level and external to buildings or other structures.

Ambient air quality standards, defined at levels below health standards, are established by the U.S. Environmental Protection Agency (EPA) and the Florida Department of Environmental Protection (DEP) for six pollutants: carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO2), ozone (O3), particulate matter, and sulfur dioxide (SO2) Since health-based criteria were used to establish the standards, these six pollutants are referred to as "criteria air pollutants".

An essential component of air quality management in the state is the identification of (1) areas where the ambient air quality standards are being violated and plans are needed to reduce pollutant concentration levels to be in attainment with the standards and (2) areas where the ambient standards are being met but plans are needed to ensure maintenance of acceptable levels of air quality in the face of anticipated population or industrial growth.

The end-result of this attainment/maintenance analysis is the development of local and statewide strategies for controlling emissions of criteria air pollutants from stationary and mobile sources. The first step in this process is the annual compilation of the ambient air monitoring results, and the second step is the analysis of the monitoring data for general air quality, exceedances of air quality standards, and pollutant trends.

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~~Air quality is an important factor in the quality of life in any area. As an area grows, traffic increases along with population growth and economic development and maintaining air quality becomes more difficult.~~

~~The major impacts upon air quality are caused by traffic, which contributes to ozone and carbon monoxide air quality standard accedences, and industry and power plants, which emit various pollutants. Six air quality standards have been established by the U.S. Environmental Protection Agency (EPA) and the Florida Department of Environmental Protection (FDEP) for the following pollutants: carbon monoxide, lead, nitrogen dioxide, ozone, sulfur dioxide, and particulate matter. The monitoring of these pollutants in Florida is under the jurisdiction of DEP. Air quality monitoring stations are installed on an as needed basis and as budgets permit. If an area does not meet the standard, it is termed a non-attainment area and remedial actions need to be implemented.~~

~~In Florida, several areas have had past problems meeting air quality standards for ozone. These areas include the counties of Duval, Dade, Hillsborough, Pinellas and Broward. Duval and Hillsborough have also exceeded the particulate matter standard. After recent changes were made to the National Ambient Air Quality Standards (NAAQS) by the USEPA, Escambia County and its airshed, which includes Santa Rosa County, also began having problems meeting the 8-hour ozone standard. In fact, at one point this region was considered to have the worst air quality in the state.~~

~~M.66~~.3.8.1 Air Quality Protection

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The Clean Air Act, which was last amended in 1990, requires EPA to set National Ambient Air Quality Standards (40 CFR part 50) for pollutants considered harmful to public health and the environment. The Clean Air Act identifies two types of national ambient air quality standards. Primary standards provide public health protection, including protecting the health of "sensitive" populations such as asthmatics,

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children, and the elderly. Secondary standards provide public welfare protection, including protection against decreased visibility and damage to animals, crops, vegetation, and buildings. EPA has set National Ambient Air Quality Standards (NAAQS) for six principal pollutants, which are called "criteria" pollutants.

The NAAQS applies to counties and cities within a metropolitan region and plays a critical role in shaping regional transportation plans and can influence regional economic vitality. In November of 2014 the EPA proposed strengthening the National Ambient Air Quality Standards (NAAQS) for ground-level ozone, based on extensive scientific evidence about ozone's effects. The recently proposed rule would revise the current NAAQS for ozone of 75 parts per billion (ppb), which was set in 2008, proposing to reduce both the primary and secondary standard to within a range of 65-70 ppb over an 8-hour average. EPA is also accepting comments on setting the standard at a level as low as 60 ppb.

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Transportation conformity is required under the CAA2 to ensure that federally-supported transportation activities (including transportation plans, transportation improvement programs, and highway and transit projects) are consistent with state air quality implementation plans. Transportation conformity applies to all areas that are designated non-attainment or "maintenance areas" for transportation-related criteria pollutants, including ozone.3 Transportation conformity determinations are required before federal approval or funding is given to transportation planning and highway and transit projects. For non-attainment areas, the federal government can withhold federal highway funds for projects and plans.

~~S~~Santa Rosa County has one DEP air quality monitoring station, which monitors for ozone and particulate matter. This air quality monitoring station is located at ~~Navarr~~Woodlawn Beach~~ Beach~~ Middle School. ~~The monitoring station recorded several exceedances of the standard in 2000, but in 2001 and so far in 2002, the site has not recorded readings exceeding the standard.~~ For the most part the monitoring station does not report exceedances. However, a change to the NAAQS could have an impact on transportation planning as describe above and therefore would affect Santa Rosa County.

While most heavy industry is concentrated in neighboring Escambia County, two industries, Air Products and Sterling Fibers, are regulated for emitting the precursors to ozone. Adverse air quality impacts also result from auto exhausts in slow moving, congested traffic areas which produce carbon monoxide and contribute to the production of ozone. Climatic conditions during the summer months also contribute to ozone and other pollutants being brought into the County from Escambia County. ~~Developments of a specified size or that meet specified requirements should be reviewed for air quality impacts.~~

Land development decisions have a direct impact on air quality because of the reliance upon automobiles for transportation. Developments with mixed-uses are encouraged since they have the potential to reduce auto trips; development design should minimize traffic congestion. ~~Bike lanes~~Alternative modes of transportation such as walking and biking, including ~~and~~ facilities within developments which link mixed uses need to be encouraged. The County will also need to balance densities with the need to maintain air quality standards.

~~Since the new NAAQS have been delayed by litigation, the Escambia Metropolitan Statistical Area (MSA), which includes Santa Rosa County, has not been redesignated a non-attainment area for ozone. Thus, no corrective actions have been imposed on local government or local industry. However, redesignation is considered eminent and the County, regional authorities and local industry have begn to prepare for the consequences.~~

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~~H.~~6.3.9 Groundwater Resources

~~H.~~16.3.9.1 Hydrology of the Northwest Florida Region

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The hydrology of the West Florida Region consists of four major aquifers: the Surficial Aquifer System, which includes the Sand-and-Gravel Aquifer, the Floridan Aquifer, Sub-Floridan System, and the Intermediate System. The composition of the Floridan System and Surficial Aquifer System allows for the storing and transmitting of ground water to, from, and throughout the respective aquifer. Each of these Systems is different, however, in that each has different water yielding properties due to variations in composition and thickness.

The Floridan Aquifer System is the most productive water-bearing unit in northwest Florida (District Water Management Plan, 17). The aquifer supplies 90 percent of the water needs in the area and it is utilized in all counties except Escambia and Santa Rosa (Ibid., 17). Limestone is the primary component of the aquifer. The layers range in thickness of 100 to 1,000 feet within northwest Florida (Ibid., 17). The Intermediate and Sub-Floridan Aquifer Systems function as groups of sediment that hamper the vertical movement of ground water. The Intermediate System limits the exchange of water between the Surficial Aquifer System and the Floridan Aquifer System. The Sub-Floridan System forms the base of the Floridan Aquifer groundwater flows (District Water Management Plan, 19).

The Floridan Aquifer is recharged by the surficial aquifer system in areas where the water in the surficial aquifer system is higher than the potentiometric surface of the Floridan Aquifer. There are no Floridan Aquifer recharge areas in Santa Rosa County. Discharge from the Floridan Aquifer occurs where the potentiometric surface of the aquifer is higher than the elevation of the water table in the surficial aquifer system. Springs occur where the overlying confining layer is thin or absent and the potentiometric surface is higher than land surface. (Huff, 1990). ~~Map 11-5 (Appendix A) shows the Potentiometric Surface of the Floridan Aquifer System.~~

~~H.2~~6.3.9.2 ~~Existing Potable Water Usage~~

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~~Santa Rosa County falls into the Northwest Florida Water Management District's Water Supply Planning Region II. Region II is made up of Walton, Okaloosa and Santa Rosa Counties. Public supply is the largest water use category in Region II, accounting for an average of approximately 37.044.97 mgd or 6370% of the total regional water use in 19952000. Okaloosa County Water and Sewer is the Region's single largest public water supplier, with an average withdrawal of 6.8 mgd in 1995. The majority of public supply water use is within the Region's coastal area, which is a popular tourist destination and is more heavily populated than the Region's northern, inland areas. Table 11-4 on the following page lists freshwater withdrawals (MGD) by category.~~

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~~Domestic self-supply and small public supply systems water use accounts for only a small percentage (53.5% or 3.12.25 mgd) of total water use within Region II. In 19952000, an average of approximately 2.31.58 mgd was used in the Region II ASC and another 0.90.67 mgd was used in the remainder of the Region.~~

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~~In 19952000, the commercial/industrial self-supplied water use category accounted for an average of approximately 11.810.65 mgd or about 2017% of the Region's total water use. The majority of this water was used within the non-ASC in Santa Rosa County. Major commercial/industrial users in Region II include Eglin Air Force Base in Okaloosa County (predominately the Floridan Aquifer), Air Products and~~

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~~Sterling Fibers in Santa Rosa County (Sand and Gravel Aquifer), and Perdue Farms in Walton County (Floridan Aquifer).~~

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Table 11-4
Freshwater Withdrawals (MGD) By Category
Santa Rosa County - 19952000

	GROUND	SURFACE	TOTALS
Public Supply	11.514.62	0.0	11.514.62
Domestic/Small Public	0.80.81	0.0	0.80.81
Com./Industrial	6.25.58	0.0	6.25.58
Agricultural Irrigation	0.20.34	0.0	0.20.34
Recreational Irrigation	1.51.45	0.0	1.51.45
Thermoelectric Power Generation	0.0	0.0	0.0
TOTAL	20.222.80	0.0	20.222.80

SOURCE: Northwest Florida Water Management District, 1995Regional Water Supply Plan for Santa Rosa, Okaloosa and Walton Counties Water Supply Planning Region II Plan Update September 2006.

Recreational irrigation water use accounted for approximately 5.435.79 mgd or 9% of the Region's total water use in 19952000. The majority of water used for recreational irrigation, an average of approximately 4.56 mgd in 1995, was used by golf courses located in the southern portion of the Region. Some of the golf courses use treated wastewater effluent (reuse) for all or part of their irrigation demands.

Agriculture irrigation in 19952000 used approximately 1.50.59 mgd, accounting for approximately 30.9% of the Region's total average water use. The vast majority of water use in this category took place in OkaloosaSanta Rosa County (1.20.34 mgd). Nurseries and corn crops were the Region's primary users of water for agricultural irrigation.

H.2 Projected Water Demand

Future water use will consist of several major components: domestic, industrial and agricultural water uses. Except for agriculture water, demand for these categories will increase proportionally to the increase in population and the changes in land use. It is anticipated that water use patterns in the near future will closely follow those of the present. It should be recognized that future water demand projections were prepared to today's patterns which do not consider extreme changes in water use practices or substantial increases in industrial or other demands. However, the introduction of one large water dependent industry could substantially alter water use in Santa Rosa County. Water demand projections are illustrated in Table 11-5 on the following page.

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Table 11-5
Projected Water Demand (MGD) By Category
Santa Rosa County – 20202025

	GROUND	SURFACE	TOTALS
Public Supply	21.126.85	0.0	21.126.85
Domestic/Small Public	0.91.39	0.0	0.91.39
Com./Industrial	8.28.70	0.0	8.28.70
Agricultural Irrigation	0.5	0.0	0.5
Recreational Irrigation	2.62.44	0.0	2.62.44
Thermoelectric Power Generation	0.0	0.0	0.0
TOTAL	33.339.88	0.0	33.339.88

SOURCE: Northwest Florida Water Management District, 2000

H.4 Groundwater Quantity and Quality

Water levels have steadily declined since water production began. Since pre-development times, water levels in the Floridan Aquifer have been lowered throughout all of Santa Rosa and Okaloosa counties and about half of Walton County. Heads are presently below MSL throughout much of coastal Santa Rosa, Okaloosa and Walton counties. At its lowest, the potentiometric surface is depressed as much as 150 ft. below MSL. This head reversal reflects a maximum loss of about 200 ft. The net result of water level declines is a regionally significant cone of depression.

Within the three counties, the cone of depression has grown in an asymmetrical fashion. Head declines are greatest (both areally and vertically) in the western half of the Region. The asymmetrical growth is driven by the relatively higher recharge in Walton County, as compared to Santa Rosa and Okaloosa counties. Heads in northern Walton County are virtually unaffected by current pumping elsewhere in the region.

The substantial depression of the potentiometric surface puts wells in coastal parts of the Region at risk for saltwater intrusion. Along the coastline, areas exist with naturally occurring ground waters that exceed drinking water standards. These areas include much of coastal Santa Rosa and Walton counties. For example, along Santa Rosa Island, sodium exceeds its standard from the vicinity of the Santa Rosa/Okaloosa county line west to Gulf Breeze and beyond. On the mainland, at Navarre, sodium is near its standard. In the Tiger Point area, both sodium and chloride have concentrations around 500 mg/L. In a large area of Walton County south of Choctawhatchee Bay, both sodium and chloride are at or above their respective water quality standards. In addition, at some unknown distance south of the Gulf shoreline, Floridan Aquifer ground water everywhere south of Okaloosa County exceeds sodium and chloride standards. As a result, the 250 mg/L isochlor may be conceptualized as a broad, shallow arc, onshore in coastal Santa Rosa County, offshore south of Okaloosa County, and onshore again in coastal Walton County.

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All of these areas with poor quality water are hydraulically up-gradient of the center of the cone of depression. Ground water from these areas is presently flowing toward the cone of depression. To date, water produced from the Floridan Aquifer in coastal Region II has been little affected by the deterioration of water quality. Prior to the cessation of their use, water from Navarre Beach wells was regularly exceeding the sodium standard (160 mg/L) and experiencing increasing chloride concentrations. In coastal Walton County, selected wells owned by Florida Community Services Corp. have experienced increases in both sodium and chloride concentrations. Elsewhere, temporal concentration trends are relatively stable. Continuation of the cone will eventually result in more widespread deterioration of water quality in supply wells and is, therefore, unsustainable. These factors lead to the current level of concern about the Region's ground water resources.

6.3.9.2 Groundwater Protection

The Department DEP has the primary role of regulating Public Water Systems (PSW)s in Florida, under Part IV of Chapter 403, F.S., and by delegation of the federal program from the EPA. The section entitled Overview of Ground Water April 1, 2014, Page 21 of 296

Florida Department of Environmental Protection, 2014 Integrated Report

Protection Programs in

Chapter 11 describes the Department's ongoing efforts to protect drinking water supplies.

A PWS is one that provides water to 25 or more people for at least 60 days each year or serves 15 or more service connections. These PWSs may be publicly or privately owned and operated. There are more than 5,500 PWSs in Florida serving over 19 million residents. Community water systems regularly test for over 80 contaminants, including bacteria, metals, organic and synthetic chemicals, and radiological parameters. Florida's compliance rate is one of the nation's highest and ranges from 91% to 96% annually. The contaminants of greatest occurrence and concern in Florida are total coliform bacteria and the disinfection byproducts trihalomethanes (THMs) and haloacetic acid. Systems that do have a violation of standards must inform the public and take corrective action to fix the problem, install additional treatment, or modify their operations. Additional information is available on the Department's Drinking Water Program website.

The

Contamination of wells by nitrate remains one of Florida's most significant ground water quality concerns. This occurs mainly in rural areas where the population is served by private wells and where agriculture is the dominant land use, and where the aquifer is poorly confined. However, it can also be a problem in localized settings where domestic onsite waste treatment and disposal systems (septic systems) are clustered. From 1999 to the present, more than 2,700 private drinking water wells have been found to be contaminated by nitrate at concentrations greater than the 10 milligrams per liter (mg/L) drinking water standard.

The largest numbers of wells found contaminated by nitrate are in counties that lie within the ridge citrus-growing region (Highlands, Polk, Lake, and Orange Counties). Soil in this area is sandy, low in fertility, and tends to leach fertilizer, and the underlying ground water resource used for water supply is highly vulnerable to contamination. Citrus growers need to fertilize frequently and at higher rates, and private wells near the groves can become contaminated. Other counties with extensive agriculture and similar April 1, 2014, Page 23 of 296

Florida Department of Environmental Protection, 2014 Integrated Report

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soil and ground water conditions that have led to a significant number of nitrate-contaminated wells include Hillsborough, Hardee, Suwannee, and Jackson.

Ground water contamination by nitrate remains an ongoing problem and a challenge to water resource managers. One effort to reduce fertilizer leaching into wells is the implementation of agricultural best management practices (BMPs) by farmers. Another aspect that may be reducing contamination is the transition from agricultural to residential land uses, resulting in less fertilizer use in some agricultural areas. Also, in some of these transitioning areas, public water supplies have become available to homeowners who were previously on individual wells. These factors may be partially responsible for the decrease in the number of wells found to be contaminated in recent years.

Refer to the Infrastructure Element Support Documentation for more information on groundwater protection, water conservation, and water supply planning.

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I. Commercial, Recreation, and Conservation Uses of Natural Resources

The natural environment of Santa Rosa County is diverse and includes several types of natural resources. Natural resources include riverine systems: the Escambia River and its tributaries; the Blackwater River and its tributaries; and the Yellow River and its tributaries. Rivers provide commercial, recreation, and conservation uses for the public. Other natural resources include beaches and dunes, wetlands, wildlife, marine habitats, vegetative communities, minerals, and forests along with estuarine systems: Escambia Bay, Blackwater Bay, East Bay and Santa Rosa Sound. These resources are used for commercial, recreation, and conservation purposes.

I.1 Marine Habitats

Marine habitats are located in open waters, and along the inshore zone of open water. Commercial fishing and shellfish harvesting occur in many portions of the Pensacola Bay system. Class II waters are suitable for shellfish harvesting. Commercial fishing is not a primary industry in Santa Rosa County. However, commercial fishing continues to be a source of income in the County. In 1999, 143,756 pounds of fish and 288,742 pounds of shellfish were caught in Santa Rosa County. While the total catch in terms of weight or value is below those of many other areas of the state, fishing is still an important aspect of Santa Rosa County. This can be evidenced by the commercial fish plants, shipbuilding, boat repair and other commercial waterfront services, located in this area.

Recreational uses include sport fishing, swimming, boating, recreational shrimping and crabbing, and passive activities. The use of marinas has increased in the past few years and will continue to increase. These uses provide both recreation and commercial uses. Marinas are for the most part commercial enterprises (i.e. sport charter, fishing boats and commercial fishing vessels) vital for public access to water-dependent and water-related activities in the coastal area of the County. The County has 3 marinas that serve the residents and boating communities. There are approximately 68 wet slips and 129 dry slips available in Santa Rosa County. Commercial fish camps are located on Ward Basin, Escambia Bay and Blackwater Bay and boat docks are located on various other water bodies in the County.

I.2 River and Estuaries

The County's riverine and estuarine water bodies are used for commercial, recreation, and conservation. Commercial uses include fishing, shrimping and crabbing in these areas. Other commercial uses may

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include marinas on a limited basis. Recreational uses include sport fishing, swimming, boating, recreational shrimping and crabbing, and passive activities. Conservation and protection of these areas include federal, state and local regulations governing waters of the state.

I.3 Wetlands

Commercial uses may include fishing, shrimping and crabbing. Silvicultural and agricultural activities occur in the wetlands, both uses contribute to the decreased quality of the wetlands. Recreational uses depend upon ownership of the land. State Parks allow fishing, swimming, boating, and passive activities. Conservation and protection uses include the protection of these areas through public ownership and acquisition, federal, state, and local regulation.

I.4 Vegetative Communities

The use of vegetative communities for commercial, recreation and conservation uses depends on the community. Wetland communities include swamp hammock, hardwood hammock, bayheads and bogs, saltwater marshes, and tidal flats. These areas are usually covered with water for most parts of the year and comprise a variety of wetland plants. Silviculture and agriculture activities are permitted in wetlands under state regulations. Wetlands are regulated through federal, state, and local development restrictions, which are implemented through the development review and permitting process.

Recreational uses depend on the ownership of the lands. Publicly owned lands provide both passive and active recreational activities. The total acreage for publicly owned parks both passive and active is identified in the Recreation and Open Space Element.

I.5 Commercially Valuable Minerals

Santa Rosa County does contain quantities of economically recoverable mineral resources. The largest mineral resources consist of fine sands and gravel found along the ridges of ancient dunes in the central and southern portions of the county. Extractions of this sand are primarily for road bases and structure pads. These operations are very small with activities apparently undertaken by several independent operators. Extraction occurs at a number of borrow areas only occasionally, apparently based upon contract requirements.

Oil, natural gas and sulfur are also found in the county, concentrated primarily in the northwestern section of the county around the Town of Jay. Approximately 25% of the oil and natural gas in place within this area has been extracted. With the advancement of oil extraction technology, the County can expect that the remaining oil and natural gas will be extracted in the future.

I.6 Cropland and Timberland

In 19972007, according to the National Agriculture Statistics Service, Santa Rosa County's total cropland acreage amounted to 59,26333,335 acres, or 9.15.1% of the County's total land area. Out of the total cropland planted, 47,47628,229 acres were harvested in a variety of crops. The harvesting amounted to approximately 29.920.77 million dollars in revenue.

In 19952005, the total land set aside for silviculture uses in Santa Rosa County, according to the 20012007 Florida Statistical Abstract, amounted to 479,900465,377 acres or 73.472.2% of the County's total land area. Out of the total land set aside for silviculture uses, 478,100465,377 acres is set aside in timberland and 1,800no acres isare set aside for timberland reserve. Table 11-6 on the following page identifies the total timberland acres and the individual ownerships.

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~~TABLE 11-6~~
~~19952006 Santa Rosa County Timberland Ownership~~

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~~Ownership~~	~~Acres~~
~~State~~	~~131,200139,923~~
~~Federal~~	~~56,30056,462~~
~~Local~~	~~6,959~~
~~Undifferentiated Private*~~	~~274,644~~
~~Forestry/ Industry~~	~~166,000~~
~~Farmer~~	~~21,200~~
~~Corporate~~	~~11,800~~
~~Individual~~	~~91,700~~
~~**Total**~~	~~478,100477,988~~

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~~**Source:** U.S. Department of Agriculture Forest Statistics~~
~~* Forestry/Industry, Farmer, Corporate and Individual have been combined into the Undifferentiated Private category.~~

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~~J. Soil Erosion Problem Areas~~

~~Water related soil erosion is not a major problem in Santa Rosa County due to the predominance of fine silica sand and loamy soils and gently to moderately sloping topography. The Troup soil series has a slope of 0-35 percent, the steepest slope in the County; the Lakeland soil series has a 0-30 percent slope; and the Dothan soil series has a 0-12 percent slope. All the other soil series in the County have slopes that range from 0-8 percent. The location of these soil series is depicted on the Future Land Use Map Series entitled Soils Map.~~

~~Soil erosion from rapid run-off can occur on sloping locations where natural vegetation cover has been removed during a land development action. Improper grading of a land development can also result in soil erosion following unusually heavy rainfalls. These potential problems are manageable. Temporary soil containment measures are now required in areas susceptible to water related erosion during project construction. Permanent drainage facilities designed to reduce the rate and volume of run-off provide for sediment containment and can control potential soil erosion from developments.~~

~~Water related soil erosion results in the transportation of sediment fines into stream courses and receiving water bodies. When receiving water bodies are upland depressions, the eventual effect is a filling and gradual build up of the bottom of the depressional area. The potential significance of this type of occurrence must be evaluated on a case-by-case basis.~~

~~When water related soil erosion occurs, excessive amounts of sediments can be transported to receiving water bodies. While the transport of sediments to receiving waters is a primary source of nutrients necessary to sustain water area biological productivity, excessive amounts of sediments have detrimental effects upon the receiving water body.~~

~~K. Pollution Related to Development~~

~~K.1 Nonpoint Source Pollution~~

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Nonpoint source (NPS) pollution consists of pollution that is transported from a variety of sources to a receiving waterbody in a diffuse or dispersed manner. It is generally considered to include most sources of pollution that do not have a point outfall to a receiving waterbody (such as a discharge pipe). This type of pollution contributes a variety of pollutants and impacts the quality of the receiving waterbody in a number of ways. Frequently, nonpoint source pollution results from the interaction between land use practices and surface water hydrology within a watershed. Nonpoint source pollution can affect receiving waters in a number of ways. Stormwater runoff increases turbidity, which, in turn, decreases the amount of sunlight available for submerged vegetation. Other forms of aquatic life are also harmed by increased turbidity and sedimentation. Nonpoint sources of pollution, especially fertilizers and organic wastes, contribute nutrients and other oxygen demanding substances, which lower oxygen levels in receiving waters. Bacteria and viruses from septic tanks, boats, marinas, and urban runoff can contaminate shellfish resources and other organisms, inducing stress and disease.

There are a number of general classifications of nonpoint source pollution, which are typically characterized by the land use practices that result in the pollutant loading. These include urban stormwater runoff, agricultural and silvicultural nonpoint pollution, dredging and filling, septic tank leachate, contaminated groundwater seepage and associated overland flows, marinas, and various unpermitted sources of pollution. Each of these types of nonpoint pollution impacts the Pensacola Bay system.

Stormwater runoff from urbanized areas, including roads, parking lots, construction sites, yards, etc.,has a significant impact on the Pensacola Bay system. The traditional emphasis of urban stormwater management has been to deal only with stormwater quantity-related issues at the local level. A consequence of this is that stormwater runoff is frequently routed to a receiving water body with very little effort to improve its quality prior to discharge. Reducing the impacts of urban stormwater runoff would require increasing the amount that is allowed to infiltrate back into the ground water and improving the quality of the discharge. Components of this would include such measures as onsite and regional stormwater treatment, buffer zones, limiting impervious areas, grassed waterways, controlling fertilizer use, and construction site best management practices. Such measures are generally implemented by local governments through the adoption of comprehensive stormwater plans, the implementation of such plans, and the use of stormwater utilities or other means of dedicated funding.

Santa Rosa County recently completed a Stormwater Task Force Report that had the development of a Stormwater Master Plan as its number one recommendation. This report also outlined numerous changes that should be incorporated into the County's Land Development Code (LDC). The County Commission has not at this point directed any of these LDC changes to be made. The report also made recommendations for the following:

1. Public Education
2. New Construction
3. Design Flexibility
4. Buffer Zones
5. Impervious Surfaces
8. Incentives
9. Paving Dirt Roads
10. Agriculture
11. Nutrient Management
12.Buffer Zones in Agricultural Practices

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~~6. Tree Preservation~~ ~~13. Revenue~~

~~7.Retrofitting Existing Problems~~ ~~14. Funding Sources~~

~~Agricultural runoff is a significant source of sediment, nutrients, and pesticides. Intensive forestry operations can cause severe sedimentation problems and can disrupt the pH of receiving waters. Also, removing trees from close to the edge of a waterbody eliminates the natural shading of the banks and may cause the average water temperature to increase. For both silviculture and agriculture, attempts at pollution abatement have historically centered around voluntary programs promoting the use of best management practices (BMPs). Recently initiated activities of the Natural Resource Conservation Service (NRCS) and Farm Service Agency (FSA), associated with the implementation of the Food Security Act and 1996 Farm Bill, have the potential to reduce nonpoint loadings from agricultural land uses, depending on the scale of their implementation. Dredge and fill activity creates and exacerbates NPS pollution through a variety of means. Fill dirt and excavated soil frequently runs off into surrounding waterbodies during excavation, filling, and related construction activities.~~

~~Wetland conversion creates additional demand for new development, with resulting runoff and non-point source pollution. Losses of wetlands reduces the capacity of the system to store runoff and flood waters and eliminates the filtering and nutrient cycling functions of the lost wetlands. Displacement of wetlands also causes hydrologic disruption within the system. Dredging causes turbidity and deposition within the aquatic system and releases nutrients and contaminants into the water column.~~

~~Another source of nonpoint pollution, and one that is often a constituent of urban runoff is septic tank leachate. Installation of septic tanks in soils with limited capacity for this use or inadequate maintenance can result in the contamination of surface waters by leachate. This is of particular importance near bayous and bays due to the susceptibility of shellfish to contamination from bacterial and viral pathogens, as well as public health concerns related to body-contact water sports. Soils bordering bays, rivers, bayous and other flood-prone areas often have severe limitations for use as septic tank absorption fields and sewage lagoon areas. As development continues in these areas, problems with surface water contamination will increase if adequate regulations and controls are not in place. The recent Santa Rosa County Stormwater Task Force Report recommended that septic tanks sited in inappropriate soils or too near surface waters with central sewer connections be replaced.~~

~~There are a number of domestic, industrial, and commercial retention and detention ponds, landfills, and storage tanks within the watershed. Some of these have a potential for discharging or leaking to ground waters. Depending on the type of contaminant, the hydrology, soil conditions, and the distance from surface waters, these groundwater discharges could have an impact upon surface waters. Holding ponds also affect surface waters via overflows during rain (or excessive inflow) events. Some facilities may have a potential to contaminate waters with hazardous wastes. Some hazardous waste sites have been identified and are regulated by DEP through the Resource Conservation and Recovery Act (RCRA) and underground storage tank programs. The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) is administered by the U.S. EPA.~~

~~Marinas contribute NPS pollution both during construction and operation and are also of concern due to the susceptibility of shellfish and other marine life to contamination by the toxins and pathogens associated with marina-related discharges. Marina construction may result in turbidity and benthic deposition from construction activities and dredging. Chronic impacts which result from marina operations may include the following: 1) oils and greases and other hydrocarbons from fuel boat exhaust, fuel spills, and illegal bilge pumpouts; 2) solid waste from trash, fish carcasses, and solvents associated with boat maintenance (deck~~

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washing, hull cleaning, etc.); 3) heavy metal contamination from lead, copper, and other pollutants found in hull paints, anti-fouling chemicals, stormwater runoff, and engine exhausts; and 4) contamination from boat head facilities, which result in increased coliform bacteria, reduced dissolved oxygen, increased nutrients and biological oxygen demand, and general water degradation. Marinas are routinely permitted with provisions to ensure that facilities are maintained – vessels are not allowed to discharge; fish carcasses, food waste, litter, fuel, oil, grease, and other pollutants are not permitted to be disposed of into the water; waste containers are to be located along the docks; fish cleaning stations and restrooms are located on upland property; fuel dispensing facilities are to be equipped with automatic shut-off valves; and emergency cleanup equipment are supposed to be maintained on-site. These permit conditions; however, have failed to eliminate NPS pollution from marinas.

A number of other arrays of docks and facilities used to serve boats are located throughout the system. No comprehensive list of unpermitted facilities is available. Such facilities, however, may include seafood processors, petroleum facilities, construction sites, mining operations, etc., which are currently operating without a permit from DEP and which may be polluting surface waters. These may be point source discharge permits but are categorized as nonpoint sources until such time as they come under DEP's permit program.

An additional source of NPS pollution is atmospheric deposition. Nitrogen originates from a variety of sources within an airshed that is considerably larger than the watershed. Computer modeling suggests that utility and mobile (such as automobile exhaust) sources are approximately equally responsible for nitrate deposition in the eastern United States (Appleton, 1995). While the Pensacola Bay region may have fewer industrial air pollution sources than are in the vicinity of Tampa Bay, it does have a considerable, and increasing, number of automobiles and may be affected by a number of industrial and utility sources throughout its airshed.

NPS Pollution Impacts Within the Pensacola Bay System

The Florida Water Quality Assessment, 305 (b) Report (Hand et al., 1996) and the Florida Nonpoint Source Assessment (Livingston et al., 1988) described NPS pollution impacts on the Pensacola Bay system and throughout the state as follows:

Escambia River Basin

Hand et al. (1996) describe certain tributaries of the Escambia River as suffering serious impacts from NPS pollution. Canoe and Pine Barren Creeks (Escambia County) suffer from runoff from farms and dirt roads. Additional tributaries identified as impacted by NPS pollution include Moore and Holly Creeks (Escambia County), which receive agricultural runoff, and Sandy Hollow Creek (Escambia County), which disappeared after sedimentation filled its channel. Turbidity problems in the river have also been associated with gravel mining in the upper portions of the basin (Livingston et al., 1988).

Yellow River Basin

Hand et al. (1996) indicate that Trammel Creek (Okaloosa County) receives runoff from the City of Crestview and that upper reaches of the Yellow River basin receive impacts from agricultural runoff (crop and livestock). Pond Creek and the Shoal River (Okaloosa County), in the vicinity of Crestview, are also noted as being impacted by nutrient, silt, and BOD loadings from nonpoint runoff. Additionally, livestock waste and sedimentation impact Horsehead Creek (Okaloosa County), borrow pit erosion and channel alteration impact Juniper Creek, and additional ecological impacts were identified in Hurricane Creek (Okaloosa County) below the Hurricane Lake impoundment (Hand et al., 1996).

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Blackwater River Basin

Nonpoint source pollution impacts on the Blackwater River system are discussed by Hand et al. (1996) and Livingston et al. (1988). Gas pipeline construction was identified as causing turbidity, sedimentation, and habitat destruction. Pesticide waste discharges from a University of Florida Agricultural Research Center and wastewater sludge land application were also identified as nonpoint pollution sources within the basin. A number of subdivisions have been constructed within the Pond Creek watershed, which has proven susceptible to habitat and flow alterations and nonpoint source pollution, including oil and grease contamination. These new subdivisions, between Pace and Chumuckla, have created nonpoint source pollution problems and increased erosion, flooding, and sedimentation within the area.

K.2 Point Source Pollution

The Pensacola Bay system has a long history of cultural impacts from a variety of uses. Point source discharges from domestic and industrial wastewater facilities have been particularly significant in the Pensacola Bay system. Point sources of pollution are those with a distinct, identifiable point of discharge (e.g., a pipe) to a waterbody. Two general categories of point sources are recognized: sewage treatment (domestic waste) and industrial facilities. In Florida, the DEP has statutory responsibility for regulating point sources of discharge.

The impacts of point source pollution on the Pensacola Bay system have been generally known for some time. The Escambia Bay Recovery Program, initiated by the EPA in the early 1970s, concluded that industrial and domestic point source discharges significantly contributed to poor conditions within the system. Subsequently, large point source discharges to the system were improved to meet more stringent permitting criteria. The Pensacola Bay system appears to have improved since that time, as demonstrated by fewer fish kills and noticeable improvements in water quality. The current condition of the system, however, remains far from optimal.

Continuing point source discharges limit the restoration of water and habitat quality, which may be expected. Permitted domestic and industrial wastewater facilities located in the Pensacola Bay system watershed are listed and generally described in Table 11-7. In addition to these sources, provided by DEP, it has been suggested that two additional sites within the watershed should be considered and regulated as point sources. The first, an asphalt and cement plant, is located at the confluence of Pond Creek and the Blackwater River. The second is the Tiger Point golf course, upon which approximately 1 million gpd of municipal wastewater is sprayed, and from which runoff is directed into Santa Rosa Sound via several culverts and canals. The possibility of a future point source has also emerged, as Champion Paper Company is (at the time of this writing) considering options for relocating its discharge from Eleven Mile Creek in the Perdido Bay basin. Possible discharge sites reported to be under consideration include Escambia Bay, in addition to a wetland treatment system.

Table 11-7
Permitted Domestic and Industrial Waste Facilities in the Pensacola Bay System Watershed
Santa Rosa County Facilities

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Name	*Design Capacity*		*Permit Status*	*Documented Problems Comments*
	MGD	*Type/Class*		

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Table 11-7
Permitted Domestic and Industrial Waste Facilities in the Pensacola Bay System Watershed
Santa Rosa County Facilities

Name	Design Capacity		Permit Status	Documented Problems Comments	
	MGD	Type/Class			
Santa Rosa County Domestic					
Avalon Utilities	0.100	DW/IIICIR	CO,	1, 3 (9/94)	
Berrydale Forestry Camp	0.050	PPDW/IIIC	REA		
Garcon Utilities (Adrian Woods S/D)	0.060	DW/IIIB	PA		
Highway 191 WWTP	0.060	PPDW/	A		
Holley Wastewater Reclamation Facility	unk	DW/IVC	PA		
Holley-Navarre WWTP	0.5002.9	IRDW/IIIB	U		
Town of Jay STP	9	PPDW/IIIC	PPA		
City of Milton STP	0.060	SWDW/IIIB	PA		
Navarre Beach STP	2.500	SWDW/IIIC	PA		
Pace Water System WWTP	0.900	IRDW/IIIB	PA		
I-10 Rest Area WWTP	1.0002.0	PP	PA		Tie into Milton WWTP
S.R. Industrial Park WWTP	0	PP	P		
South Santa Rosa County Regional Reclaimed	0.013		P		
South S.R. Utilities System	0.030	IRDW/IIIB	U		Tie into Milton
South Santa Rosa Utility System East	unk		PA		
NAS Whiting Field STP	2.000	SW	U		
	unk		TOP		
	0.870				

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Table 11-7
Permitted Domestic and Industrial Waste Facilities in the Pensacola Bay System Watershed
Santa Rosa County Facilities

Name	Design Capacity		Permit Status	Documented Problems Comments
	MGD	Type/Class		
				n W W T P
Santa Rosa County Industrial				
Ag. Rsch. and Educ. Center	0.001	DF		
Air Products & Chemicals	1.500	SW		
B Lowery Pit		IW	A	
B&H Contracting, Inc.		CBP	U	Generic Permit
Classic Auto SPA		ND		
Cytec Industries	5.5	SW	CO	
Double G #1		PET	A	Generic Permit
Florida Gas Transmission	0.005	IW		
Golden Car Wash	0.002	DF		
Holley Dirt Company Sand Mine		IW	A	
M & L Sand Company		SWI		Sand mine permit
Mooney Sand Mine		IW	A	Generic Permit
Navarre Beach Coin Laundry		DP		
Panhandle Aerospace LLC		IW	A	
Pea Ridge Pit		IW	A	Generic Permit
Pensacola Ready Mix – Midway		CBP	A	Generic Permit
Pensacola Ready Mix – Milton		CBP	A	Generic Permit
Pensacola Ready Mix – Navarre Batch		CBP	A	Generic Permit
Plant		CBP	A	Generic Permit
Rinker Materials – Milton		SWI		Sand mine permit
Russell Sand Mine	0.002	DF		PET
Spot Free #2		IW	A	
Sterling Fibers, Inc		IW	A	
Taminco	1.9	CBP	A	Generic Permit
WPR – Plant 1	1.5	CBP	A	Generic Permit
WPR – Plant 2		SWI		PET
Bradshaw's #1		SWI		PET
Cook's Phillips 66		SWI		PET
Nugget Store #33		SWI		PET
Pace Cluster				

Source: Florida Department of Environmental Protection, 19962008

Abbreviations and Symbols

Type of Facility	Permit Status	Facility Class	Documented Problems	Facility Status Code
DW – Domestic WWTP	SW – Surface water discharge	IIIB – Ext Air: 2 MGD <=flow<8MGD	A – Active(1) Poor operation/maintenance	
IW – Industrial Wastewater	SWI – Intermittent SW discharge	IIIC – Ext Air: 0.025 <=flow<2 MGD	WN – Warning order	U – Under Construction(2) Collection system inflow/infiltration

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Table 11-7
Permitted Domestic and Industrial Waste Facilities in the Pensacola Bay System Watershed
Santa Rosa County Facilities

Name	Design Capacity		Permit Status	Documented Problems Comments
	MGD	Type/Class		

CBP – Concrete Batch Plant
SWP – Periodic controlled SW discharge
IR - Spray irrigation to land
PP - Discharge to percolation pond
DF - Discharge to drainfield
ND - No discharge (recycle system)
PET - Petroleum cleanup site discharge
DWL – Wetland discharge
AWWT – Advanced wastewater treatment
DW - Domestic WWTP
IW - Industrial Wastewater

CBP – Concrete Batch Plant
IVC – Biofilm 0.025 MGD <=flow<3 MGD
FO - Final order
CO - Consent order
AO - Administrative order
EP - Expired permit
TOP - Temporary operating permit
NP - Operating without permit
RE - Under renewal
IIIB – Ext Air: 2 MGD <=flow<8MGD
IIIC – Ext Air: 0.025 <=flow<2 MGD
IVC – Biofilm 0.025 MGD <=flow<3 MGD

(3) Failed to meet water quality standards
A – Active
U – Under Construction

L. 6.3.10 Hazardous Wastes

Hazardous wastes have not posed a major problem for Santa Rosa County due to the lack of large, hazardous waste-producing industries in the County. However, the County may be affected in future years by a recent increase in regulation of small, as well as large, hazardous waste generators.

Hazardous wastes are identified through its characteristics, for example, corrosivity; by their specific industry sources, for example, wood preservation, bottom sediment sludge from creosote process wastewater treatment; and by nonspecific sources, for example, spent halogenated solvents. Table 302.4 in 40 CFR contains a list of hazardous substances and reportable quantities.

Some materials and wastes which may be detrimental to the environment are not regulated by the above DEP or EPA rules, but may be covered by other agencies at the federal, state, or local level, such as radioactive materials or pesticides. However, in Santa Rosa County, the primary agency responsible for hazardous waste regulation is the DEP.

The State has required an inventory of hazardous waste generators, especially those who produce small quantities of waste, and determine the amount and type of wastes generated. The management and disposal practices were to be inventoried and the need for additional storage, transfer and treatment facilities determined. Potentially suitable sites for storage and transfer were designated by each county and for each region. This study was is performed for Santa Rosa County by the West Florida Regional Planning Council (WFRPC) and was completed in 2002.

L.1 Waste Generators

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Large quantity generators (LQG) are those firms that produce 2,200 pounds or more of hazardous wastes per month or 2.2 pounds or more of acute hazardous waste per month. According to the Florida Department of Environmental Protection (FDEP), there are four (4) large quantity hazardous waste generators in the County: Air Products and Chemicals, Inc., Fabbro Marine Group, Odom Fiberglass, Inc., and Serling Fibers, Inc.

Table 11-8 identifies those large quantity generating companies functioning within the County as of 19992007 and the amount of waste generated by each company in pounds. Large quantity hazardous waste production and associated problems have not been a major concern for the County in the past due to the small amount of hazardous waste generated. However, as the County develops, future problems may become apparent as the potential for pollution to occur increases.
is included herein by reference.

Table 11-8

Hazardous Waste Large Quantity Generating Facilities

Santa Rosa County, 19992007

Generating Facilities	Air Emissions	Surface Water Discharges	Underground Injections	Releases to Land	Total Releases (pounds)
Air Products & Chemicals, Inc.Taminco Methylamines, Inc.	528,52477,600	0143,6480	0	117,2463,200	789,4188 0,800
Fabbro Marine Group	30,88217,500	0	0	0	30,88217,500
Odom Fiberglass, Inc.	18,541	0	0	0	18,541
Sterling Fibers, Inc.	45,866	0	320,736	43,831	410,433

Source: U.S. Department of Environmental Protection, Office of Environmental Information, 19992008.

Conditionally exempt small quantity generators (CESQG) generate less than 220 pounds per month and less than 2.2 pounds of acute hazardous waste per month. Small quantity generators (SQG) are those businesses that generate 220 to 2,200 pounds of hazardous waste per month. The total waste produced by conditionally exempt and small quantity generators in Santa Rosa County was approximately 1,861130.177 tons from 19962002 through 20022007. The largest quantity of wastes generated was lead-acid storage batteriesUsed oil and filters. Battery shops, service stations, and repair shops generated about 817 tons of lead and batteriesService stations and repair shops produced approximately 82 tons of these materials.. Used oil and filtersLead acid storage batteries were the second most frequently generated waste. Battery shops, service stations and repair shops generated about 23 tons of lead acid batteries. Approximately 717 tons of these materials were produced primarily by service stations and repair shops. The third largest type of waste produced was antifreezenon halogenated solvents, which amounted to approximately 10013.4 tons. Table 11-9 on the following page identifies the conditionally exempt and

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small quantity generators by EPA hazardous waste categories based on specific hazardous waste characteristics in Santa Rosas County from 19962002 through 20022007.

L.2 Landfills and Waste Sites

The Santa Rosa County Central Landfill is the only active landfill site in the County. The landfill consists of 593 acres with approximately 84 acres currently filled. This leaves about 509 acres remaining for future use.

Santa Rosa County is currently served by 12 solid waste collectors, Browning Ferris (BFI), Waste Management, Breeze Sanitation, Community Sanitation, Gandy Garbage Service, J&L, North Santa Rosa, PAT, Sunbelt, Red River, Sutton, and Arrow Disposal.

Table 11-9

Conditionally Exempt and Small Quantity Generators

Santa Rosa County, 1996 – 2002 – 2008

SQG EPA Waste Categories & Waste Characteristics	Active Facilities	Pounds	Tons	Percentage %
Antifreeze	4312	199,18010,354	99.65.2	5.33.98
Batteries (Lead – Acid)	10020	1,633,85346,474	816.923.2	43.817.85
Corrosive (Acid/Base)	3	10,621	5.3	0.2
Pesticides	372	68,683636	34.30.3	1.80.24
Fixer/Film/Developer	534	106,7241,470	53.40.7	2.80.56
Gasoline and Fuels	146	6,4014,093	3.22.0	0.11.57
Halogenated Solvents	331	20,87550	10.40.0	0.50.02
Inks/Dyes/Toner	1	105	0.1	0.0
Lamps (Fluorescent – HID)	51	1,20860	0.60.0	0.00.02

Table 11-9

Conditionally Exempt and Small Quantity Generators

Santa Rosa County, 1996 – 2002 – 2008

Metals/Metal Contaminated	145	52,944152	26.50.1	1.40.06
Nonhalogenated Solvents	14730	105,66826,713	52.813.4	2.810.26
Other Toxic Chemicals	6	44,763	22.4	1.2
Paints/Coatings	155	12,7923,527	6.41.8	0.31.35
Rechargeable Batteries	6	2,647	1.3	0.0
Solvents (Mixed/Other)	264	20,1002,529	10.11.3	0.50.97
Used Oil (And Filters)	30956	1,435,527164,296	717.882.1	38.563.10

Source: West Florida Regional Planning Council, 20022009

L.3 Hazardous Waste Pollution Problems

There are two businesses in the County that have been sited by DEP for potential groundwater, surface water, and soil contamination due to the production and disposal of hazardous waste. Air Products and Sterling Fibers are both under permit requirements to cleanup a plume of contaminated groundwater on their sites associated with various spills and incidents over the years.

EPA has identified one site in Santa Rosa County as being on their Comprehensive Environmental Response Compensation and Liability Act (CERCLA) list. This list identifies EPA's potential Super Fund sites. The site identified is Naval Air Station, Whiting Field.

The County accepts some household hazardous waste (i.e., paint and batteries) at the Central Landfill and disposes it to outside contract sources. The County does not accept hazardous waste that requires long term or improved storage. The County accepts other hazardous waste one time per year on amnesty day and that waste is collected at remote sites from the landfill. This waste is also disposed of through outside contract sources. This is administered through a cooperative grant program with Okaloosa County.

The County, through the Escambia County Health Department, participates in the DEP's Underground Storage Inspection Program and administers the compliance portion of the State's Pollutant Storage Tank Program (PSTP).

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M. Natural Resource Protection

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Large land areas of Santa Rosa County are undergoing conversion from open space and agriculture to urban uses. Increased development pressure has also become focused on wetlands and other low-lying areas. Floodplain habitat is being converted to other land uses, which fragments and displaces habitat, degrades nearby habitats, and causes other problems (flooding, hazard risk, etc.) (FDEP, 1996). The current conversion is expected to continue through the foreseeable future. Habitat quality and productivity have suffered and continue to suffer as a result. This section identifies policies and programs that protect natural resources in Santa Rosa Count and identifies the need for more protective measures when applicable.

Natural coastal communities such as those found in Santa Rosa County are among the most threatened in Florida. Undeveloped and lightly developed areas along barrier islands are characterized by distinct zonation, from sandy Gulf beaches, through intermittent scrub along dune ridges and swales, to maritime forests, and finally to salt-tolerant herbaceous vegetation and limited emergent vegetation along the bay shore. Habitat loss, pollution, and reduced fish and wildlife populations and diversity result when shoreline development is unbroken by conservation areas or very low density buffer zones. Population growth and the increasing popularity of the Florida Panhandle as a residential and recreational destination has intensified competition for limited coastal resources. Across much of the region, government jurisdictions and private landowners have failed to plan for the coexistence of competing shoreline uses and functions.

The Pensacola Bay system has been subjected to chronic environmental stress from industrial and domestic discharges, non-point source pollution runoff, and dredge and fill and other direct habitat displacement. Seagrass communities have been profoundly impacted, wetland area continues to decrease, and riverine and estuarine benthic habitats have been stressed. Habitat quality is inherently interrelated with all other issues identified in this plan.

In addition to direct losses, impacts of dredge and fill activities on wetlands include hydrologic disruption and degradation due to sedimentation and NPS pollution. The habitat value of these areas is greatly diminished due to fragmentation and ecological simplification. There are mitigation requirements in place designed to offset permitted losses. Restored and, especially, created wetlands, however, are commonly assessed as being functionally inferior to natural wetlands (e.g., Moy and Levin, 1991). Additionally, mitigation measures often amount to assurances to not impact additional wetlands, as opposed to actual creation or restoration. Efforts at tracking and long-term monitoring and oversight of mitigation projects may also be inadequate. The cumulative effects of years of dredge and fill activity are particularly severe.

M.1 Surface Water Improvement and Management Programs

In 1987, the Florida Legislature passed the Surface Water Improvement and Management (SWIM) Act. This Act funded the State's Water Management Districts to restore some of the critically threatened water bodies, such as the Pensacola Bay system. The Act established a process and criteria for the Water Management Districts (WMD) to develop and implement plans, including appropriate programs or projects, for restoring and protecting priority water bodies of regional or statewide significance. Each WMD is to develop a plan for each specific priority water body in the order in which they appear on the WMD's priority list. Each Plan is to contain written strategies (programs and projects), including activities and expenditures, for restoring or preserving that water body based upon the requirement of Chapter 62-43, Florida Administrative Code. The approved Plans must be updated every three years (Environmental Permitting & Growth Management Handbook, 92).

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The Department of Environmental Protection has the central oversight authority for reviewing and approving the waterbody priority lists, reviewing and commenting on restoration and protection plans and administering the release of funds from the SWIM Trust Fund to the Water Management Districts. The Fish and Wildlife Conservation Commission, Department of Community Affairs, Department of Agriculture and Consumer Services and local governments are mandatory review agencies for the SWIM Plans. Each of the five Water Management Districts is responsible for the implementation of the SWIM Plans in their District (Environmental Permitting & Growth Management Handbook, 92). Key aspects of the Pensacola Bay System SWIM study area are as follows:

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1. Water and Sediment Quality Program. This program includes activities intended to reduce NPS pollution throughout the watershed, to identify needed reductions in pollutant loading, to identify effective management practices, and to assist local governments in their efforts to protect water resources. Additionally, it provides for working with local governments, state and federal agencies, and community organizations to implement stormwater retrofits and associated restoration actions for degraded basins.
2. Habitat Quality Program. This program includes cooperative activities designed to protect existing habitats, restore degraded habitats, and develop a more complete understanding of the status and trends of the system so as to improve resource management.
3. Administration, Planning, and Coordination Program. This program provides for coordination of a long-range strategy for restoration and protection of the system, participation in the ongoing resource management effort across all levels of government, use of SWIM to leverage other sources of funding, and measurement of progress in achieving objectives of the SWIM Plan.
4. Public Education and Awareness Program. This program provides for promoting awareness of the values and vulnerabilities of the system, awareness of actions individuals may perform to protect the resource, and providing educational resources for both the community as a whole and to primary and secondary school educators.

M.2 Surficial Aquifer Protection Measures

Santa Rosa County provides some measure of surficial aquifer protection through stormwater management practices that require general and widespread use of detention/retention storage systems with all new developments.

The freshwater lenses on the barrier islands are fragile and cannot tolerate heavy water usage. Other sources of water are needed to meet the water demands of turf grasses and exotic horticultural requirements. New sewage treatment plant effluents can be used for non-food production irrigation, such as turf grasses. Where exotic horticultural practices are deemed desirable, the use of gray water for irrigation can be used.

The further usage of surficial aquifer dependent private wells on barrier islands for non-potable water demands can be expected to result in the gradual loss of the freshwater lenses in the unconsolidated sands beneath the islands.

The surficial aquifer can be protected by identifying all the major public wells and establishing a wellfield protection area around the well to limit the types of land uses and densities allowed within the established recharge areas. Since Santa Rosa County's major source of drinking water is the surficial aquifer, land uses and densities should be limited around the established wellfield protection areas and around any identified surficial aquifer high recharge areas.

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In response to existing and anticipated water supply problems, the NWFWMD has designated the coastal area of Santa Rosa, Okaloosa and Walton counties as a Water Resource Caution Area (WRCA). Refer to Map 11-6 (Appendix A) for the location of the WRCAs.

The WRCA designation subjects all non-exempt withdrawals to more rigorous scrutiny to ensure that the proposed withdrawal does not result in unacceptable impacts to the resource. Permittees within a WRCA also have increased water use reporting requirements, must implement water conservation measures, and must improve water use efficiencies. They are also required to perform an evaluation of the technical, environmental, and economic feasibility of providing reclaimed water for reuse. In Santa Rosa, Okaloosa, and Walton counties, use of the Floridan Aquifer for non-potable purposes is prohibited in the WRCA (Ryan et al. 1998).

M.2(a) Water Reuse/Conservation

Existing Programs

Potable water supplies can be extended by water conservation policies and practices. The following programs are currently in place in Santa Rosa County.

The Florida Uniform Energy Efficiency Building Code applies to all new construction and specified reconstruction. The code requires water-conserving fixtures such as low-flush water closets that use 3.5 gallons of water and filters on faucets and showerheads.

The Northwest Florida Water Management District requires water conservation practices in applications for Consumptive Use Permits (CUPs). Permits are reviewed for practices that meet the reasonable, beneficial criteria. Conservation practices for commercial and industrial CUP applicants are applicant specific.

Agricultural users are required to minimize or eliminate off-site discharge. Discharges during the hours from 9 a.m. to 5 p.m. are limited to .5 inch over a weir and no discharge is permitted after 5 p.m. Many farmers now employ a closed loop ditch system to irrigate their fields instead of letting water run off-site. The WMD is also investigating other methods for agricultural water reuse. The District requires all golf courses to draw water from the following sources, which are ranked in order of priority:

1. Effluent from wastewater treatment plants
2. Retention ponds
3. Shallow aquifer system or Floridan Aquifer, whichever is of least quality
4. As a last resort, the highest quality water can be used.

A large majority of utilities within Region II have implemented some form of conservation measure within their individual service areas. Many of these utilities have implemented, or have plans to implement, several different, additional, conservation measures. Water is used for many different purposes within Region II, but the single largest use within public supply is for some form of irrigation. It is in the reduction of water use for irrigation purposes that conservation efforts have their biggest impact. Irrigation can also be augmented with other sources such as the Sand-and-Gravel Aquifer, stormwater and reclaimed water.

Direct Water Reuse

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Effluent from wastewater treatment plants can be treated to a specified level and then reapplied to land (lawns, golf courses, agricultural areas) or used in some industrial processes. Agricultural irrigation, sewage treatment, and industrial processes often generate water that could be used again if treated to an environmentally acceptable level. Non-potable water supplies can be used for the following: agricultural irrigation, landscape irrigation, ground water, recharge, industrial uses, aesthetic uses, fire protection, construction dust control, toilet flush, and wetlands restoration. The proximity of wastewater treatment plants to golf courses, landscaped areas, agricultural areas, and environmental factors such as soil characteristics, depth to the water table, and proximity of the application site to surface waters are important considerations when considering the potential for implementing a reuse program. Wastewater treatment plants must have a design capacity of 1.0 mgd for land application of wastewater to be considered cost effective. Reuse, however, though it reduces potable water demands, conserves water, and solves problems with wastewater disposal, can also increase the cost of disposal by requiring irrigation lines to be run to disposal sites. However, a water utility can recoup the installation costs by charging for the reuse water. New return lines installed at the same time a plant is under construction reduces the initial costs.

Reuse of treated wastewater, also called reclaimed water, is an important element in the reduction of water used from the Floridan Aquifer within Region II. Most of the wastewater treatment plants within the Region are already treating at least some of their wastewater to levels that allow them to reuse the water for irrigation purposes. Demand for this water has seen a steady rise over the past few years. This demand comes in the form of residential areas, golf courses, parks, schools, and other public areas, that have been able to reap the benefit of having more water to use, with fewer restrictions on their ability to irrigate during dry periods. The single largest demand for using reclaimed water comes from golf courses that lie relatively close to wastewater treatment plants. This is the case in Santa Rosa County. Residents in the south end of the County have also proposed a policy to require all new subdivisions to use reclaimed water for irrigation. In addition, Santa Rosa County, which runs the Navarre Beach Wastewater Treatment Plant, is working with Eglin Air Force Base to use parts of its reservation as sprayfields for reclaimed water.

- Phase 1: Development of the Planning List

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During the first phase of any basin rotation cycle, the Department initially evaluates all readily available water quality and biological data, using the methodology described in the IWR. During this phase, water segments that are identified as potentially not meeting water quality standards are included on a Planning List.

- Phase 2: Development of the Verified List of Impaired Waters

During the second phase of the basin rotation, the Department implements additional sampling and strategic monitoring activities, focusing on those waters that were April 1, 2014, Page 168 of 296

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identified and placed on the Planning List during the first phase of the basin rotation. The goal of these activities is to ensure that sufficient data and/or ancillary information are available to determine (i.e., to "verify")—using the methodology described in the IWR—whether a waterbody segment is impaired and if the impairment is caused by a pollutant. In conjunction with the determination of impairment status, the Department actively solicits stakeholder input, and assessment results are finalized at the end of the second phase based on available data.

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~~To conclude the second phase of the basin rotation, after the assessments have been completed, those waterbody segments identified and verified as impaired are placed on the state's Verified List of impaired waters. Correspondingly, those waterbody segments determined to be no longer impaired or in need of a TMDL are placed on the Delist List. Both the Verified and Delist Lists are adopted by Secretarial Order and submitted to the EPA to update the state's 303(d) list.~~

~~Waterbody segments identified as not meeting water quality standards due to a pollutant are prioritized for TMDL development. The priority ranking considers the severity of the impairment and the designated uses of the segment, taking into account the most serious water quality problems, most valuable and threatened resources, and risk to human health and aquatic life.~~

~~Segments verified as impaired are initially assigned a medium priority. A high priority is assigned if: (1) the impairment poses a threat to potable water supplies or to human health, or (2) the impairment is due to a pollutant that has contributed to the decline or extirpation of a federally listed threatened or endangered species. Impairments due to exceedances of fecal coliform criteria are assigned a low priority. Waters listed due to fish consumption advisories for mercury are designated high priority. In September 2012, the Department adopted a statewide mercury TMDL that requires an 86% reduction in all emission sources.~~

~~The Department intends to address all listings with a high priority within five years after they are added to the Verified List, to address listings with a medium priority within five to 10 years (subject to available resources), and to address listings with a low priority within 10 years. April 1, 2014, Page 169 of 296~~

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~~ Phase 3: TMDL Development~~

~~The third phase of the basin rotation cycle consists primarily of TMDL development and is initiated when the Verified List is adopted by Secretarial Order. When TMDLs are completed for segments on the Verified List, they are adopted by rule, and those segments are subsequently removed from the state's Verified List of impaired waters.~~

~~ Phases 4 and 5: BMAP Development and Implementation~~

~~During the fourth phase of the watershed management cycle, a BMAP aimed at reducing the pollutant loads linked to the verified impairments may be developed, and implementation is initiated in the fifth phase of the basin rotation cycle to achieve the pollutant reduction goals of the TMDL.M.3 Floodplain Protection Measures~~

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~~The purpose of the National Flood Insurance Program is to protect lives and development from flooding; it does not preclude development in the 100-year floodplain. The County had adopted Land Development Regulations, which address building in the floodplain. The Land Development Regulations requires that the first floor of inhabitable living space be built 1 ft. above the designated base elevation as determined by the Flood Insurance Rate Maps.~~

~~The fill required by the base elevations reduces the flood storage capacity of the floodplains; however, storage compensation is provided by the storage of stormwater on site as required by the Northwest Florida Water Management District in two rules: 40C-42 and 40C-40 and by the County's Land Development Regulations, which regulates stormwater for development under the District's thresholds.~~

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A majority of the floodplains are protected from development because most of the floodplains are coterminous with freshwater and estuarine wetlands. These wetlands are regulated by dredge and fill rules of the Department of Environmental Protection and the Army Corps of Engineers.

Santa Rosa County has taken steps to further protect flooplains from development using zoning measures. These zoning categories preclude high density private development, in favor of resource conservation or low intensity public use. As the spatial analysis illustrates, significant portions of the Flood Hazard Zones associated with the Escambia River, Blackwater River and Yellow River have been zoned for uses that do not include dense development or highly intensive uses. Portions of Navarre Beach in both Flood Hazard Zone AE (100-year flood plain) and Zone VE (100-year flood plain with wave action) have also been zoned for park or conservation uses. This action reduces the amount of development in high hazard areas and will significantly lower losses from future flood events.

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M.4 State and Federal Programs for Regulating Upland Wetlands

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The *U. S. Army Corps of Engineers* regulatory program considers waters of the United States to be all tributary streams to navigable waters to a point where flows are less than 5 cubic feet per second. In general, this criterion is being interpreted as the uppermost 5 square miles of all watersheds, but actual determination is made on a case-by-case basis. The determination of federal jurisdiction of a proposed project will be made by the Corps of Engineers. All proposed development actions by private individuals or public agencies are subject to Corps of Engineers regulatory review.

The *Florida Department of Environmental Protection (DEP)* exercises regulatory jurisdiction over dredge and fill activities in waters of the State to their landward extent. Landward extent is determined by the dominance of certain wetland indicator vegetation species defined in Chapter 17-4 of the Florida Administrative Code.

Wetlands Regulation Problems

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The police powers of the federal government and state government are being applied to all proposed development actions that directly disturb tidal and freshwater wetlands. Primary state agency efforts directly focus upon existing wetland conditions and areas. Field inspections typically give limited review to the long-term functional condition of observed hydric soils, the vegetation indications of expanding or contracting wetland conditions, and the hydrological regime necessary for sustaining wetland conditions in a given depressional area. Similarly, the size and potential extended utility of the wetland often are given varying degrees of consideration by state and federal regulatory agencies.

The differing jurisdictional reviews of upland wetlands are based upon different criteria used by the reviewing agencies. Private property owners still do not have clear non-conflicting criteria to follow that may be acceptable to all permitting agencies. The County recognizes that specific state and federal agencies are provided with specific and limited legislatively derived responsibilities. Each state and federal agency normally performs only those functions specifically authorized. This process has resulted in a plethora of specific, uncoordinated, and fragmentary police powers of state and federal regulatory agencies concerned with one or more environmental issues. These state and federal agencies regularly exercise their specific police powers supported by extended resources not available to individuals or local governments.

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The above state and federal regulatory process has placed an extreme burden on small local governments. Local governments lack the resources to obtain technical personnel capable of responding to the fragmented regulatory mandates imposed by state and federal regulatory agencies. At the same time, responsible technical assistance from state and federal agencies concerned with environmental issues is limited.

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M.4(a) U.S. Army Corps of Engineers Regulatory Program

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The U.S. Army Corps of Engineers regulates activities in open waters and wetlands under the following four separate but related laws:

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1. The Rivers and Harbors Act of 1899 which requires authorization for activities such as constructing piers, bulkheads, subaqueous pipelines, filling, dredging, stream channelization, and similar works in navigable waters of the United States. In response to 1968 court rulings, permit application reviews, now include protection of fish and wildlife, conservation, pollution, aesthetics, ecology, and general public interest;

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2. The Federal Water Pollution Control Act of 1972 requiring the restoration and maintenance of the chemical, physical, and biological integrity of the nation's waters. Section 404 of the Act established the permit program to regulate discharges of dredge or fill material into waters of the United States;

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3. The Clean Water Act of 1977 expanded the Corps Section 404 authority to include, but not be limited to, all coastal and inland waters, lakes, tributaries to navigable waters, wetlands adjacent to navigable waters, and certain isolated wetlands and water bodies;

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4. The Marine Protection Research and Sanctuaries Act of 1972 authorizes the Corps of Engineers, under Section 103, to issue permits for the transportation of dredged material for ocean disposal.

In general, Corps of Engineer permits are required for any construction in all tidal areas channel ward of mean high water lines.

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M.4(b) Florida Department of Environmental Protection (DEP) Permits

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The State Wetlands Protection Act of 1984 (Chapter 403, Florida Statutes) authorizes regulation of wetlands to protect and preserve water quality and preserve fish and wildlife habitat. Determination of regulatory jurisdiction is based upon an area's regular and periodic inundation, physical waterbody connections to "waters of the State," and dominance by the specified wetland indicator species. Waters of the State are rivers, streams and their tributaries, bayous, sounds, estuaries and bays and their natural tributaries, most natural lakes and the Atlantic Ocean and Gulf of Mexico to the seaward limit of the state's territorial boundaries.

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The Florida Department of Environmental Protection (DEP) development action review evaluates the potential impact of a proposed project on the waters of the State. This review process is intended to assure that the project will not:

1. Obstruct or alter the natural flow of navigable waters;

2. Induce harmful or increase erosion, shoaling of channels, or create stagnant areas of water;

3. Interfere with the conservation of fish, marine resources and wildlife, or other natural resources;

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4.Induce destruction of oyster beds, clam beds, or marine productivity including, but not limited to, destruction of natural marine habitats and grass flats suitable as nursery or feeding grounds for marine life.

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M.5 Natural Habitat Protection

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Goal 10 of the State Land Development Plan provides for the protection and acquisition of unique natural habitats and natural systems. This goal also includes the restoration of degraded natural systems to a functional condition. Achieving this goal requires the cooperation of the County with other agencies in the identification of unique areas. The County should pursue means in which to protect natural habitats and systems. This may include bond purchases, land grants from private citizens, a land trust, or the purchase of land through public organizations such as the CARL program or Preservation 2000/Florida Forever. Substantial areas of floodplain and wetland in the watershed, have been acquired and protected via the Save Our Rivers and Preservation 2000 programs. In particular, the NWFWMD has purchased 53,890 acres of land along the Escambia and Yellow Rivers, in Escribano Point and within the Garcon Point peninsula.

The Florida Natural Areas Inventory (FNAI) provides listings of the presence of listed species within the County. The inventory was established to aid in the protection of listed species and should be recognized by the County in land use and land acquisition decisions. In addition to this inventory, the Florida Fish and Wildlife Conservation Commission publishes an official list of endangered and potentially endangered fauna and flora in Florida.

Important wildlife habitats throughout the County, which can be linked together to create corridors, should be identified, protected, conserved and regulated. Other appropriate agencies should be consulted for the identification and study of these areas.

The Florida Fish and Wildlife Conservation Commission (previously the Florida Game and Freshwater Fish Commission) has designated Coastal Maritime Hammock, Xeric Oak Scrub, and Longleaf Pine/Wiregrass as unique upland communities. These three communities are threatened and provide habitat for endangered and common species.

The coastal hammocks are found along riverbanks in addition to ocean areas. Sandhill communities contain long leaf pine with a hardwood understory. Long leaf pine communities provide habitat to a wide variety of wildlife. At this time, the uplands are not afforded the same type of protection as the wetlands. These upland areas are highly developable and therefore have development pressures imposed upon them.

In an effort to address the declining environmental trend, the State Legislature in 1993 merged the Department of Environmental Regulations (DER) and Department of Natural Resources (DNR) into the Department of Environmental Protection (DEP). After these two agencies were merged into one, DEP was charged with the responsibility of developing a strategy to protect the functions of the entire ecological system. So through the public participation process of over 300 Florida citizens, private parties, local governments, State governmental agencies, and some Federal governmental agencies, development of concepts to create an integrated environmental permitting system took place. Thus, Ecosystem Management came into being. Ecosystem Management bases its philosophies on environmental principles which recognize that all living things are clearly interconnected and cannot be managed in isolation from one another. This is not a new concept, but one that has been around for a long time and is well understood by many scientists and various environmental land managers.

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~~What is revolutionary about Ecosystem Management is the way DEP plans to implement these philosophies. In the past, all too frequently, local governments reviewed development plans on a case-by-case basis limited by the boundaries of the specific project. Projects were not reviewed considering the "big picture" or considering the overall ecological perspective. Furthermore, a vehicle was not provided to support the conservation and preservation of regional ecological systems. Now, a vehicle is being provided through Ecosystem Management.~~

~~Ecosystem Management's philosophies are defined by their over riding theme of *stewardship of the land* and their central focus is Place-Based-Management. These management concepts encourage innovative, cooperative solutions to environmental problems through the involvement and cooperation of all of Florida's citizens, not just the government. DEP defines *stewardship of the land* as a strong sense of ownership in and responsibility for Florida's land, air, water and other resources by all of Florida's residents. Place-Based-Management focuses on an area or place of sufficient size to address major hydrological and ecological connections on a regional scale.~~

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~~As stated before, Ecosystems Management depends on the involvement and cooperation of all of Florida's citizens, not just the government. Ecosystem Management encourages innovative and cooperative solutions to environmental problems, accountability in the decision making process, better integration of governmental and private programs, and the dismantling of institutional barriers in an effort to promote wise stewardship of Florida's natural and cultural resources.~~

~~DEP has identified regional Ecosystem Management Areas (EMA) throughout Florida. Ecosystem Management Areas (EMA) are defined by drainage basins or watersheds that are hydrologically and ecologically connected and are of environmental significance. Currently, there are no Ecosystem Management Areas identified in northwest Florida.~~

~~In the new era of cooperation between all levels of government identified as having common goals, the Florida Fish and Wildlife Conservation Commission (previously FGFWFC) in cooperation with DEP and FNAI have published a revolutionary environmental publication entitled Closing the Gap in Florida's Wildlife Habitat Conservation System (here by referred to as the"GAP"). This publication, as its name implies, fills the GAP by identifying those areas not already conserved through any other conservation techniques necessary to sustain wildlife bio-diversity.~~

~~Today, many animals are caught in a state of siege as habitats needed to sustain wildlife populations are rapidly disappearing. This publication identifies areas referred to as Strategic Habitat Conservation Areas, visually identifying (through the GIS system) habitat conservation areas throughout the State. This same information is further broken down County-by-County. These maps provide visual references necessary to sustain a minimum bio-diversity essential to sustain the State's rarest animals, plants, and natural communities well into the future. The Geographic Information System (GIS) was utilized to identify important habitat areas from documented occurrence records of 44 indicator species (of biological diversity) and to identify minimum habitat areas necessary to sustain these species that are not presently being protected through any other conservation techniques.~~

~~The GAP report identified several large concentrated Strategic Habitat Areas in Santa Rosa County. Please refer to Map 11-7 (Appendix A) for these locations. The established Strategic Habitat Areas are particularly important to the County as natural resources which not only attract tourists, but also creates an environment that is consistent with a sustainable community atmosphere. Eco-tourism should be considered an economic resource that communities must pay more attention to in the future.~~

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In addition, the GAP report also identified Biodiversity Hot Spots in the County. Please refer to Map 11-8 (Appendix A) for these locations.

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M.6 Air Quality Protection

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Santa Rosa County has one DEP air quality monitoring station, which monitors for ozone. This air quality monitoring station is located at Navarre Beach Middle School. The monitoring station recorded several exceedances of the standard in 2000, but in 2001 and so far in 2002, the site has not recorded readings exceeding the standard.

While most heavy industry is concentrated in neighboring Escambia County, two industries, Air Products and Sterling Fibers, are regulated for emitting the precursors to ozone. Adverse air quality impacts also result from auto exhausts in slow moving, congested traffic areas which produce carbon monoxide and contribute to the production of ozone. Climatic conditions during the summer months also contribute to ozone and other pollutants being brought into the County from Escambia County. Developments of a specified size or that meet specified requirements should be reviewed for air quality impacts.

Land development decisions have a direct impact on air quality because of the reliance upon automobiles for transportation. Developments with mixed uses are encouraged since they have the potential to reduce auto trips; development design should minimize traffic congestion. Bike lanes and facilities within developments which link mixed uses need to be encouraged. The County will also need to balance densities with the need to maintain air quality standards.

Since the new NAAQS have been delayed by litigation, the Escambia Metropolitan Statistical Area (MSA), which includes Santa Rosa County, has not been redesignated a non-attainment area for ozone. Thus, no corrective actions have been imposed on local government or local industry. However, redesignation is considered eminent and the County, regional authorities and local industry have begn to prepare for the consequences.

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M.7 Soil Resource Protection

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The County manages potential development-related soil erosion problems through the Land Development Code, which regulates stormwater from development. The County standard to retain the first 1-inch of stormwater on site is twice the amount required by the Water Management District. In addition, the County requires grassing and mulching to protect the receiving body of water against erosion, siltation, and rivulets caused by surface run-off. Soil erosion techniques are also incorporated by the Water Management District in their review of developments under their management and storage of surface water and stormwater rules.

The County maintains a comprehensive approach to wetlands protection, including the following components:

Preservation: In 2008, approximately 45% of all wetlands within Santa Rosa County were under public ownership and 35% were designated for Conservation/Recreation use on the Future Land Use Map. The County will continue to support the purchase and preservation of wetlands. In addition, wetlands have been preserved as part of private land purchases required for mitigation. The County will work with the FDEP and the USACOE to identify the location of these mitigation wetlands and designate those areas as Conservation/ Recreation on the Future Land Use Map.

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~~Future Land Use Map: The land use categories shown on the Future Land Use Map take into consideration the compatibility of development with wetland resources. Undeveloped areas of the County with the largest concentrations of wetlands have been designated for low density development. Wetlands under public ownership have been designated for Conservation/Recreation use.~~

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Designated Use Attainment Categories for Surface Waters in Florida

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Designated Use Attainment Category Used in the IWR Evaluation	*Applicable Florida Surface Water Classification*
Aquatic Life Use Support-Based Attainment	Class I, II, and III
Primary Contact and Recreation Attainment	Class I, II, and III
Fish and Shellfish Consumption Attainment	Class II
Drinking Water Use Attainment	Class I
Protection of Human Health	Class I, II, and III

This is a two-column table. Column 1 lists the designated use attainment category used in the IWR evaluation, and Column 2 lists the applicable Florida surface water classification.

Although the IWR establishes the assessment methodology for identifying impaired waters, the EPA has

actively encouraged states to use a five-category reporting system in reporting the status of all jurisdictional waters (segments) in meeting their relevant water quality standards. Under this reporting

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